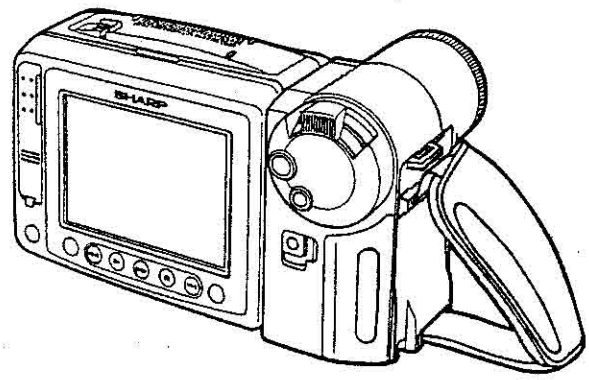
VL-E760U
VL-E765U

SHARP SERVICE MANUAL

S38N2VL-E760U

LIQUID CRYSTAL CAMCORDER 8 NTSC



MODELS VL-E760U VL-E765U

In the interests of user-safety (Required by safety regulations in some countries) the set should be restored to its original condition and only parts identical to those specified be used.

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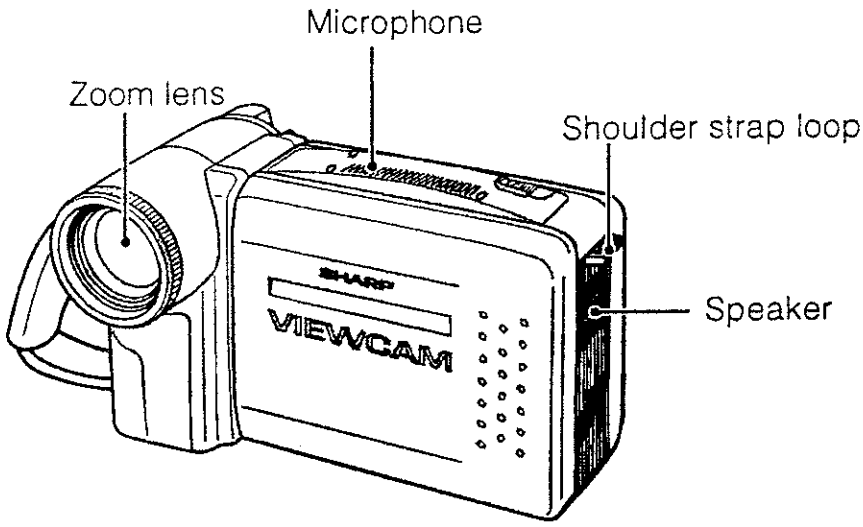
SHARP CORPORATION

This document has been published to be used for after sales service only.
The contents are subject to change without notice.

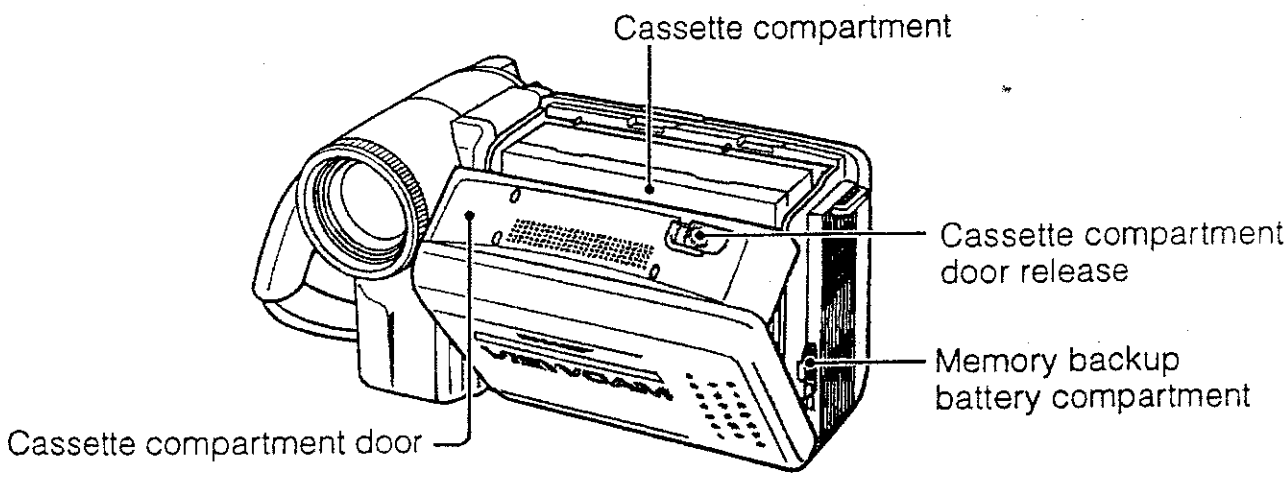
3. PART NAMES AND FUNCTION

For details on the use of each control.

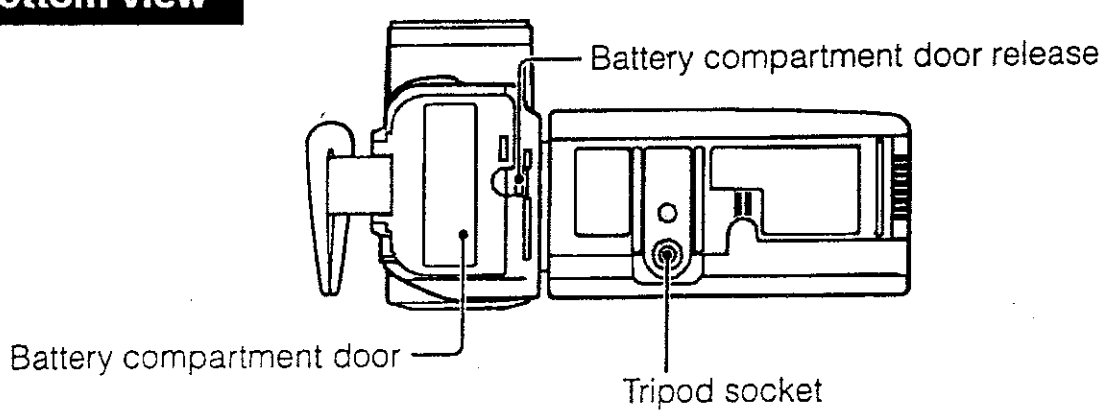
Front view



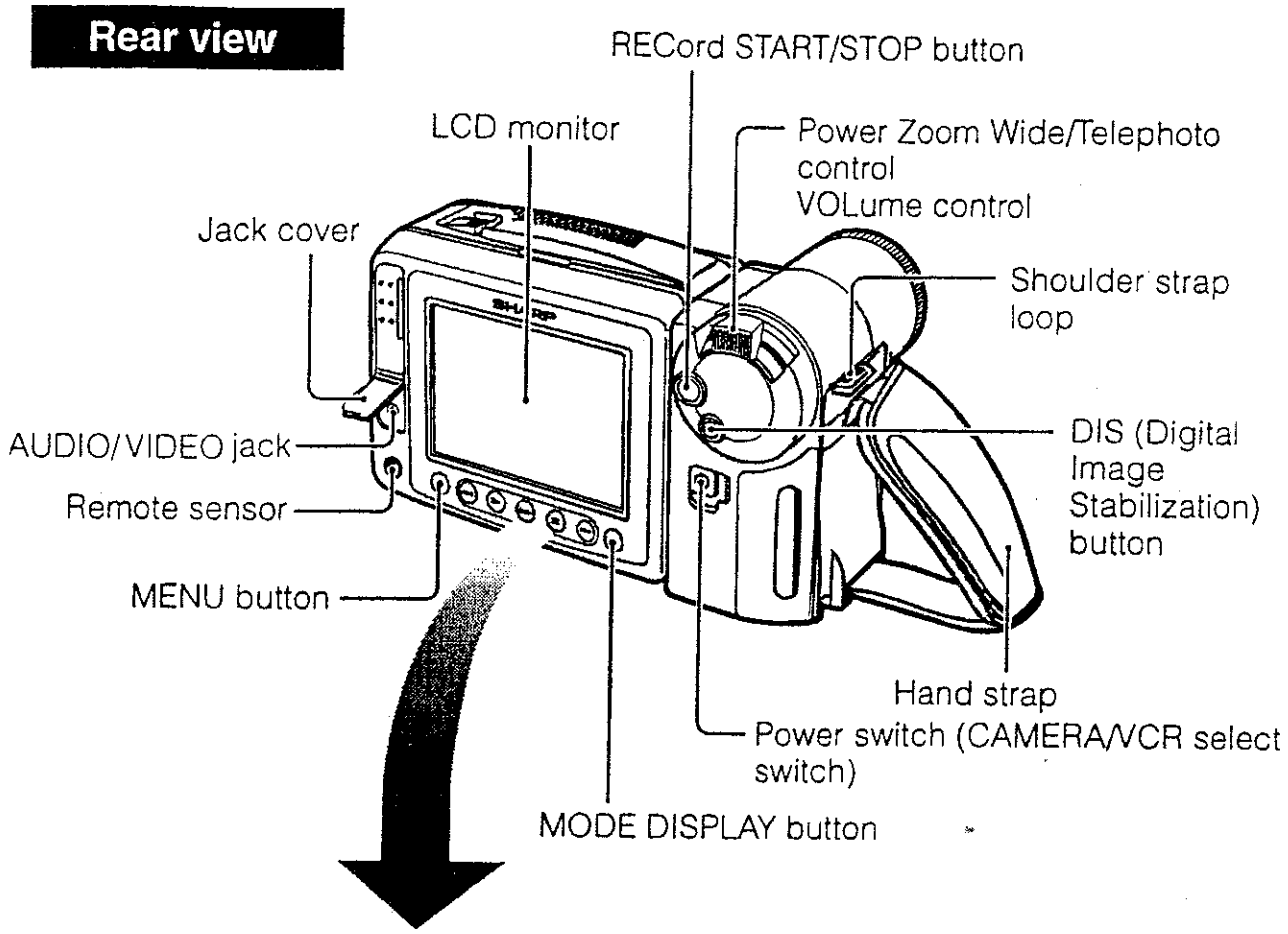
When the cassette compartment door is open



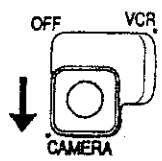
Bottom view



Rear view



CAMERA mode



Picture Effect/Auto Focus/Strobe button (VL-E760U)
Auto Focus/Strobe button(VL-E765U)

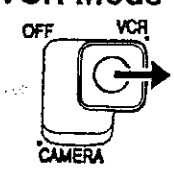
Scene Menu/Backlight Compensation/Gain-up button

Digital Quick Zoom/ Reverse Edit Search/ Snapshot button

Forward Edit Search/ Fade button

Quick Return/Still Recording button

VCR mode



Rewind/Reverse Search button

Fast Forward/ Forward Search button

Still/Search/ Pause button

Play/Tape Counter button

Stop button

Note:

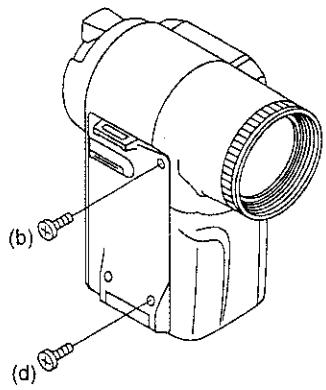
- The button functions listed above are those for normal recording and playback operations.

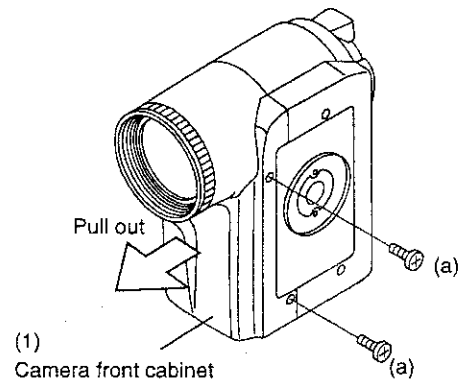
4. DISASSEMBLY OF THE SET

4-1. Removal of the camera section

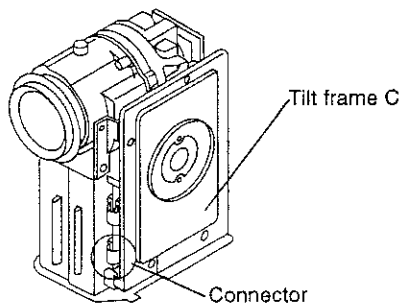
Note:
Before removing the cabinet, turn off the power supply, and ascertain that the battery has been removed.

1. Remove one screw ((d)XiPSF20P04000), one screw ((b)LX-HZ0018TAFF), two screws ((a)LX-HZ0018TAFN), and pull out the camera front cabinet (1).





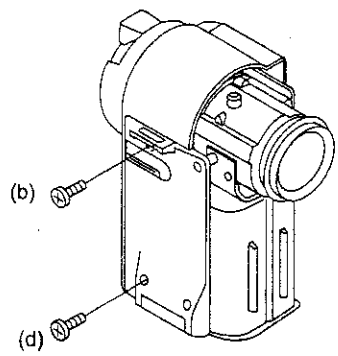
2. Remove the connector (1 pc.).

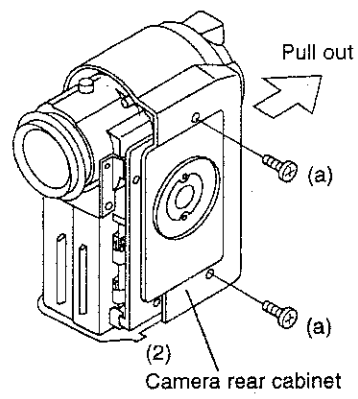


* Remove the Camera rear cabinet, after removing the connector.

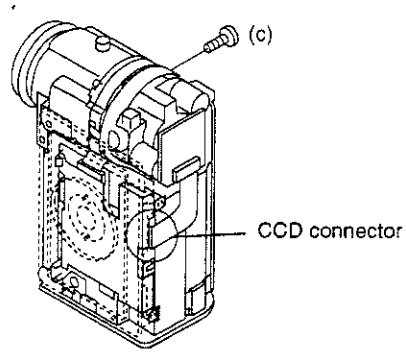
Note:
When assembling the camera rear cabinet, lay the FPC between the camera shield case and the tilt frame C, and insert it into the connector.

3. Remove one screw ((b)LX-HZ0018TAFF), one screw ((d)XiPSF20P04000) and two screws ((a)LX-HZ0018TAFN) and pull out the camera rear cabinet (2) backwards.

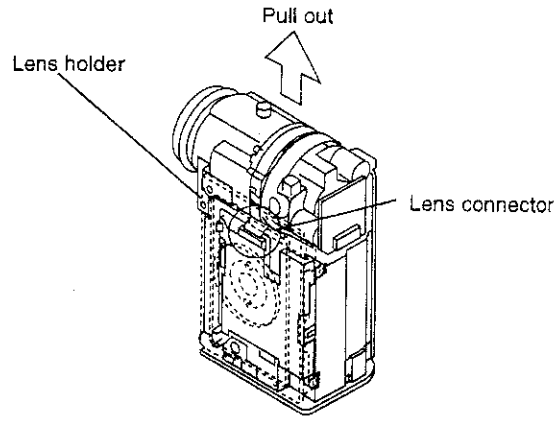




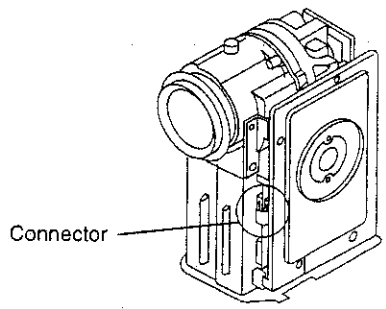
4. Firstly, remove the CCD connector from the Camera PWB, then remove one screw ((c)LX-HZ0045TAFN), the reverse side in this figure (Not remove the lens holder in this section).

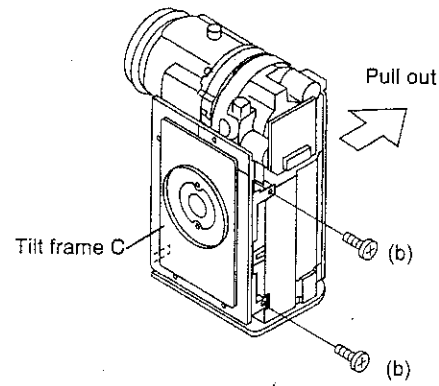


5. Pulling the lens holder, and pull out the lens upwards. Then, remove the lens connector.



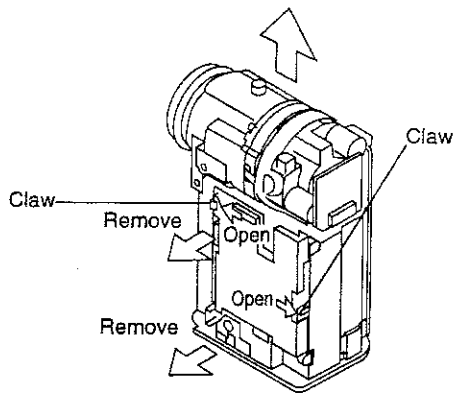
6. Remove one connector and two screws ((b)LX-HZ0018TAFF) and pull out the lens unit from the tilt frame C.

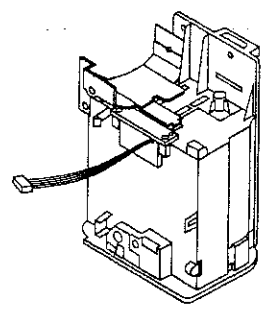




Note:
Be careful so as not to damage the FPC since the camera PWB unit is connected to the lens unit with the FPC attached.

7. Remove the camera PWB unit and the lens unit together, opening two claws of the battery holder outward.

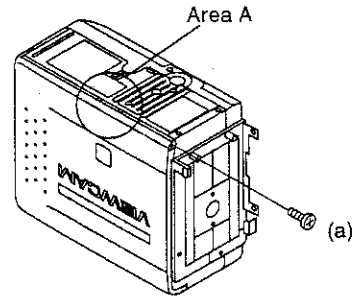




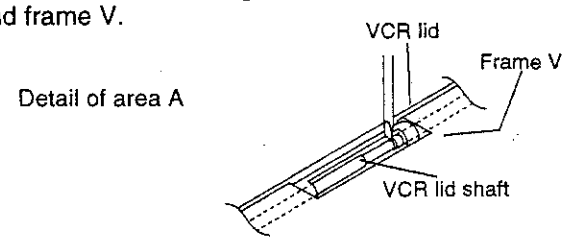
4-2. Disassembly of the VCR main body

1. Removal of the VCR lid shaft

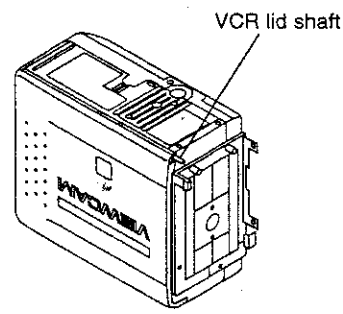
(1)Remove one screw ((a)LX-HZ0018TAFN).



(2)Bring the jig (example: slotted precision screwdriver) into contact with the removal groove of the VCR lid shaft, and slide the screwdriver with care to prevent injuring the VCR lid and frame V.

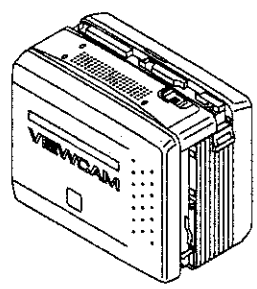


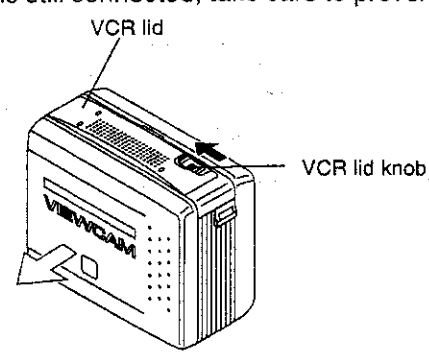
(3)Pull out the VCR lid shaft head which projects beyond the surface of the VCR lid.



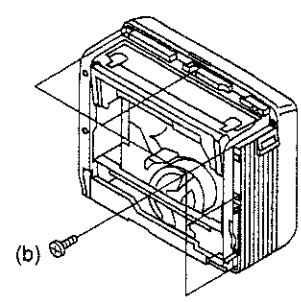
2. Disassembly of the cabinet L

(1)Slide the "VCR lid knob" in the arrow direction, and slide the VCR lid in the arrow direction as far as the cabinet L fastening screw is visible. (Left figure) Since the connector of the microphone is still connected, take care to prevent excessively sliding the VCR lid.

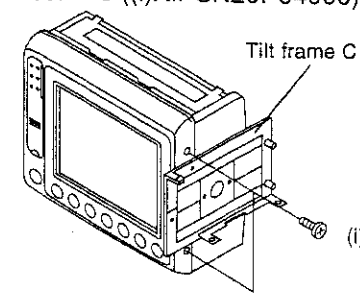




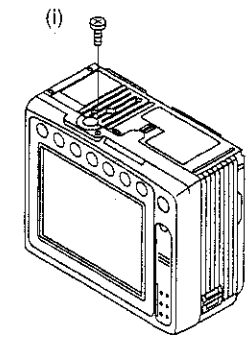
(2)Remove five screws ((b)LX-HZ0018TAFF).



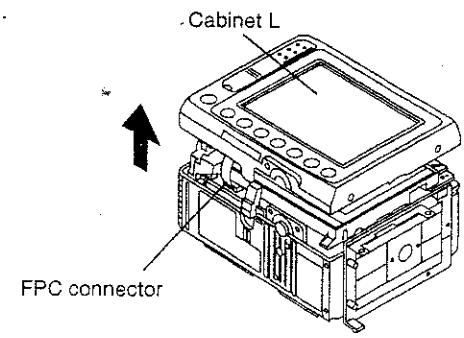
(3)Turn the tilt frame C so that the screwdriver can be easily inserted, and remove two screws ((i)XiPSN20P04000).



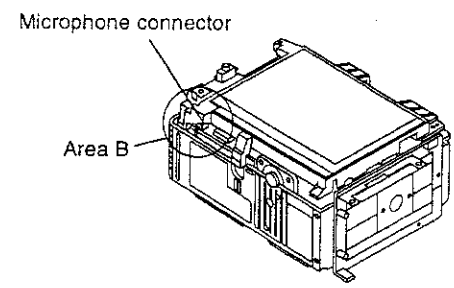
(4)Remove one screw ((i)XiPSN20P04000).



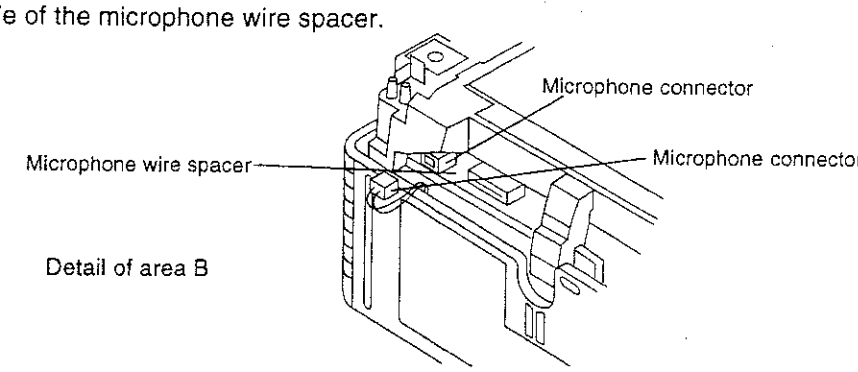
(5)Remove the cabinet L to the midway, and disconnect the FPC connector.



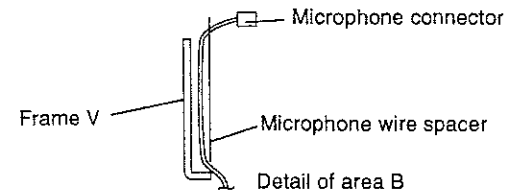
3. Removal of the VCR lid
(1)Disconnect the microphone connector.



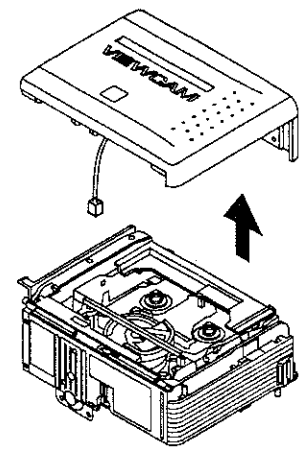
(2)Remove the connector cable from the hole of the microphone wire spacer.



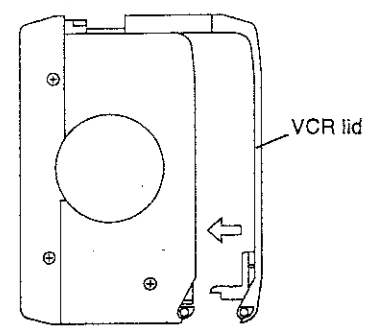
(3)Remove the microphone wire spacer from the Frame V.



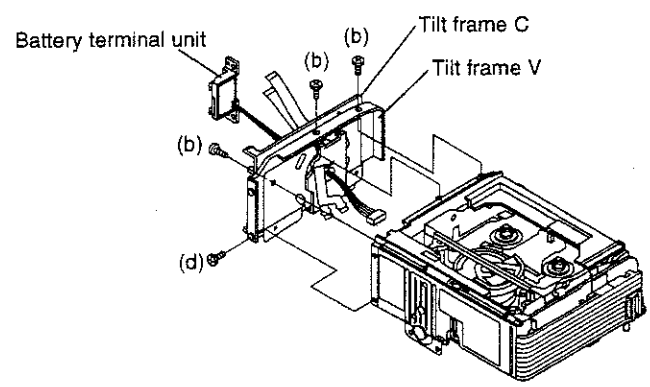
(4)Pull out the microphone wire cable with care to prevent it from interfering with the mechanical parts, and remove the VCR lid.



Caution for installation of the VCR lid
When installing the VCR lid, move the VCR lid in the arrow direction, keeping the VCR lid parallel to the main body as shown below.

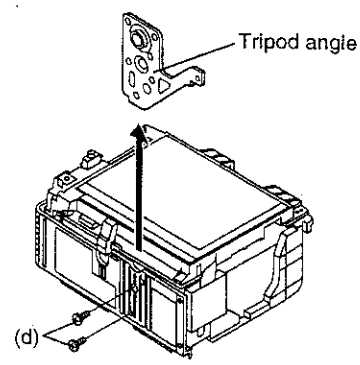


4. Removal of the tilt unit
(1)Remove three screws ((b)LX-HZ0018TAFF).
Remove one screw ((d)XiPSF20P04000).
Disconnect three connectors.
Remove the tilt unit from the cabinet of the main body.

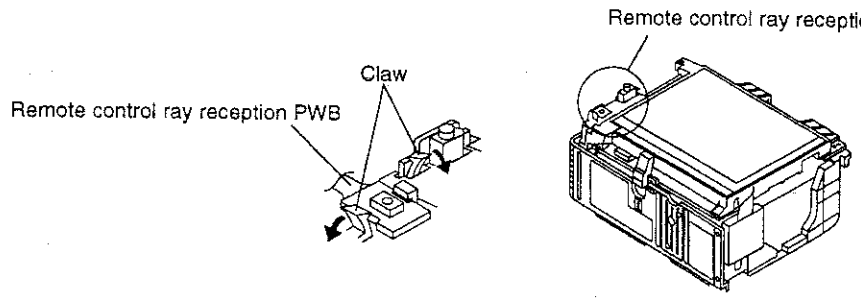


5. Disassembly of the LCD holder

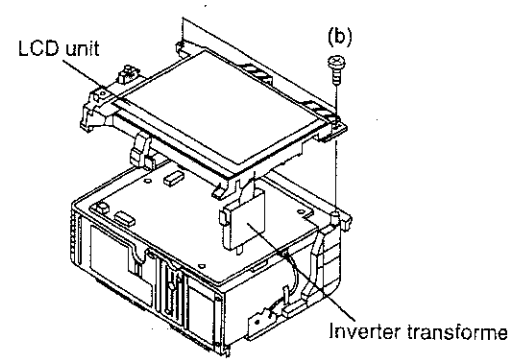
(1)Remove two screws ((d)XiPSF20P04000), pull out the tripod angle.



(2)Remove the remote control ray reception PWB from the LCD, (Distorting the claw (snap-fit type) of the LCD holder, release its engagement.)



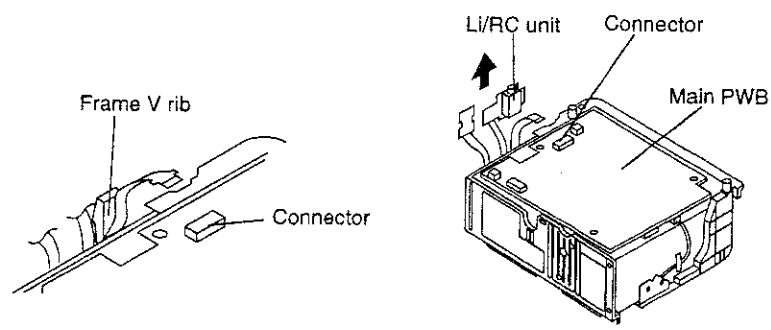
(3)Remove two screws ((b)LX-HZ0018TAFF) and two connectors, and remove the LCD unit (with inverter) from the main body.



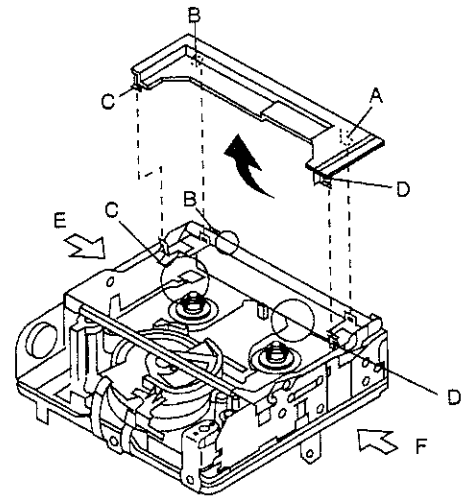
(4)Disconnect the connector which connects the Li/RC unit to the main PWB, and slide the Li/RC unit in the arrow direction from the frame V.

Note:

When connecting the FPC, pass it through the inside of rib of frame V (to prevent the FPC from being jammed).



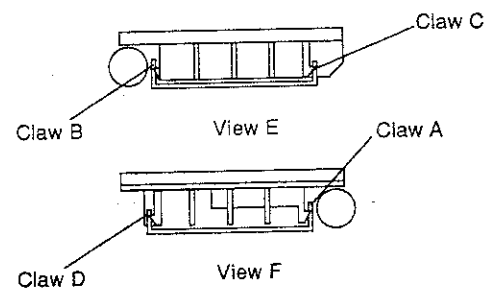
6. Removal of the cassette compartment lid
(1)Using the slotted precision screwdriver, push and turn the two claws (C and D) which fasten the cassette compartment lid, and the cassette compartment lid will be removed from the hook area of the cassette component.



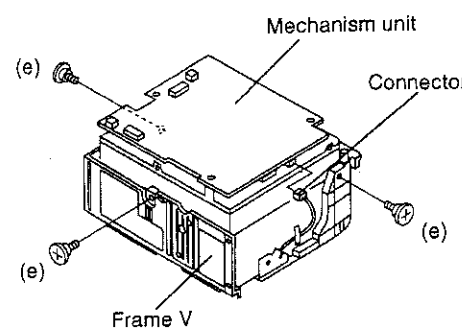
(2)Turning the cassette compartment lid in the arrow direction, lift it, and the claws A and B will be disengaged to remove the cassette compartment lid.

Note:
Take care to prevent breaking the claws of the cassette compartment lid.

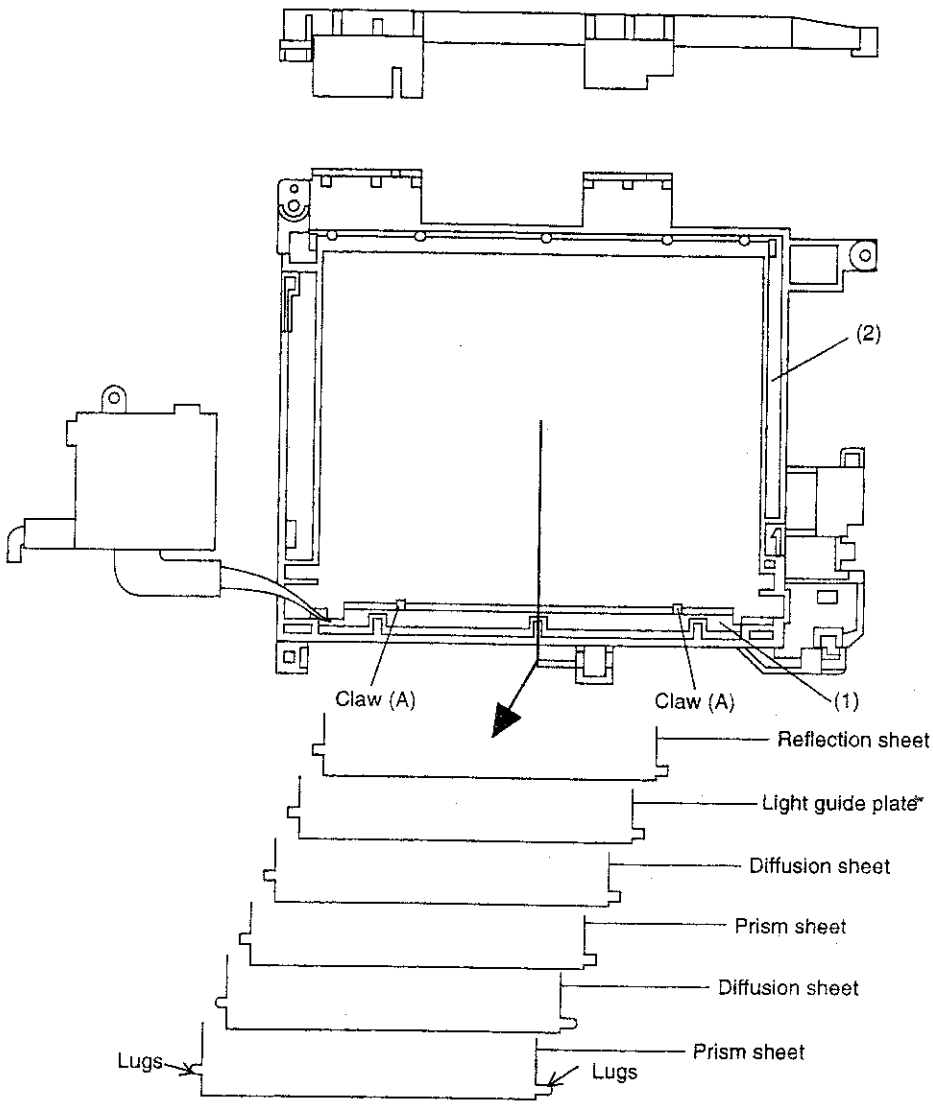
Note:
When fixing the cassette compartment lid, first engage the claws A and B, and then engage the claws C and D, verify that the four claws (A, B, C and D) of the cassette compartment lid are securely engaged as shown in the view below.



7. Disassembly of the frame V
(1)Remove three screws ((e)LX-BZ0191TAFD) and one connector, and remove the frame V from the main body.

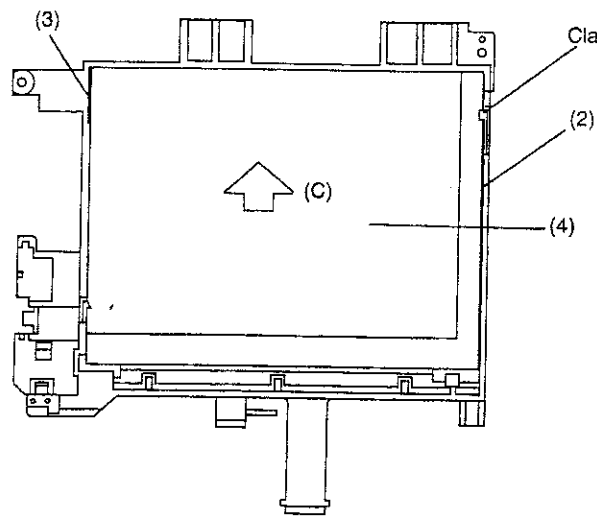


8. Disassembly of the LCD panel



1. Disengage two claws (A), and remove the lamp inverter unit (1) from the LCD holder (2).
2. Remove the sheets from the LCD holder (2).
3. Pull the LCD glass retaining (3).
4. Disengage the claw (B), and slide the LCD panel (4) in the (C) direction to remove the LCD holder (2).

Note:
When handling the prism sheet, diffusion sheet, light guide plate, and reflection sheet, do not touch any part other than lugs and sides. Put the light guide plate and reflection sheet between reflectors of lamp. Therefore, install them together with the lamp ass'y.



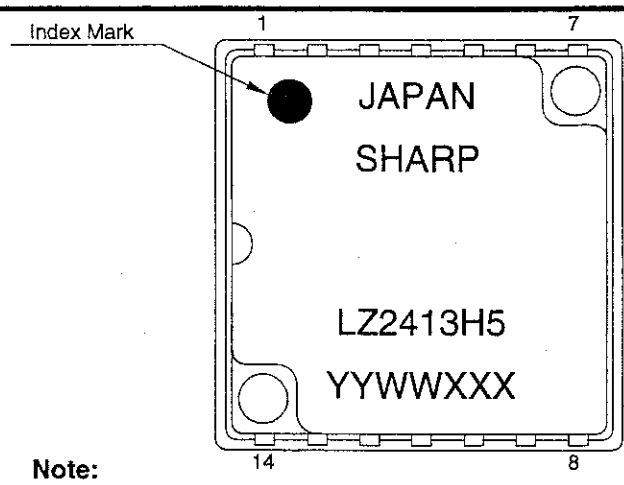
Claw (B) Disengage the claw, and remove the LCD panel.

4-3. REPLACEMENT OF CCD SENSOR

4-3-1. BEFORE REPLACEMENT

1) The CCD image sensor is more sensitive to electrostatic breakage than C-MOS LSI. Therefore sufficient means to prevent electrostatic damage must be taken when it is replaced.
- Ground the soldering iron.
- Ground also the human body, using the wrist strap(through an 1 Mohm resistor).
- Until the CCDsensor is mounted on the PWB, fit it to the conductive sponge, and short-circuit the foot lead.

2) Take utmost care so that the surface glass of CCD sensor and optical filter are not contaminated and damaged. If any contamination is found, for example fingerprint, wipe it off with silicon paper or clean chamois skin.
3) When replacing the CCD sensor, use the antistaic grounded soldring iron, and perform quickly soldering.



Note:
Indication of voltage (ofd) set value.
Voltage set value is indicated on the back of the CCD sensor.

V-OFD voltage marked on the back of CCD

4-3-2. REMOVAL OF CCD

1) Unsolder the CCD sensor leads from the sensor PWB.
2) Take out the sensor PWB.
3) Remove the two screws (6), and remove the sensor holder and CCD sensor.

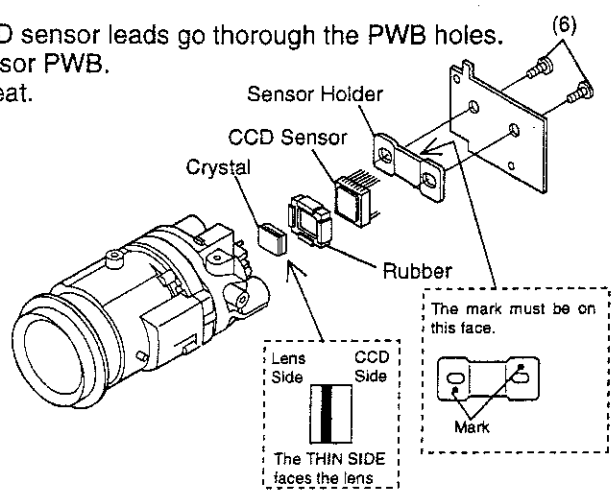
4-3-3. MOUNTING OF CCD

1) Place the lens unit upright (since the CCD sensor mount ID faces upward, care must be taken so as not to damage the front lens of unit), put the crystal filter first and then the dust protection rubber into the CCD holder of lens unit. Set the crystal unit with its thin side toward the lens unit.
2) Place the CCD sensor so that the its No. 1 pin is at the right lower (Positioning hole to be at right), and put the CCD sensor into the CCD holder. For smooth and tight fitting, press the right lower part of back of CCD sensor, and then press the left upper part.

Note: Pay attention to the direction of CCD sensor.

3) Place the sensor holder so that its two round markings be visible, and fix the sensor holder with the two screws ((6)LX-HZ0013TAFF).
4) Mount the sensor PWB so that the CCD sensor leads go thorough the PWB holes.
5) Solder the CCD sensor lead to the sensor PWB.

Note: Take care not to apply excessive heat.



4-4. INITIAL SETTING OF E²PROM IC

4-4-1. E²PROM data alterable ways

1) Set the switch of main body to CAM, and use the remote control (RRMCG0033TASA) for adjustment to turn on the adjustment mode.

2) VCR adjustment address setting.
   V ADJ
   00 "00" is blinking
   After an objective address was established, play key is pushed and set.
   In addition, numerical change uses a "REW" or "FF" key.

3) VCR adjustment data setting.
   V ADJ
   00 ## Value of "##" differs by an address.
   After an objective data was established, "PLAY" key is pushed and set.

4) When data of other address are changed successively, push "STOP" key, and please repeat operation to 5) from 3).

5) When SW of the substance is turned into off, data are written to E²PROM from systematic microcomputer.

4-4-2. IC702 (E²PROM)

When the IC702 has been replaced, make the following settings and adjustments.

1. Remove the backup battery (CR2025)
2. Turn power switch to CAMERA
3. Setting up the V ADJ mode as follows.

* After press the CONTINUE key, press the VCR ADJ key on service remote control (RRMCG0033TASA).

address	E760U data	E765U data
03	D8	FD
0B	27	02
01	00	00
09	FF	FF
04	00	00
0C	FF	FF
02	01	01
0A	FE	FE

4. After setting the above data, clear the V ADJ mode and turn off the power by pull out the battery pack or DC cable. Neglect about 30 seconds after turned of power, because data of address becomes effective after microcomputer is reset.

   Now the setting of data is completion.

Adjustments to follow
Make the system controller servo, VCR, and LCD adjustments according to their respective instructions.

4-4-3. CAMERA ADJUSTMENT

When the IC2 has been replaced, make the camera adjustment according to its instructions.
All the camera adjustment data are written in the E²PROM provided on the lens unit. Therefore, when the lens is replaced, the camera must be adjusted again according to the camera adjusting procedure.

4-5. ADJUSTING THE Y/C, AUDIO AND LCD CIRCUITS ON MODELS WITHOUT A/V IN MODE (A/V IN MODE SET-UP PRODUCE)

1) Set the switch of main body to CAM, and use the remote control (RRMCG0033TASA) for adjustment to turn on the adjustment mode.

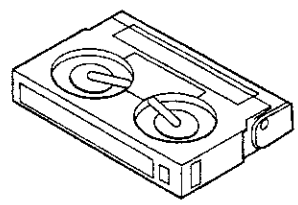
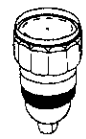
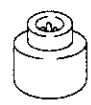
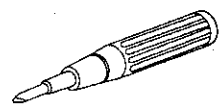
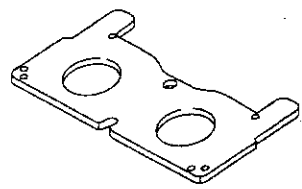
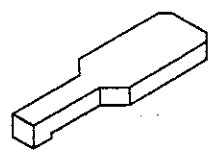
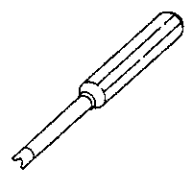
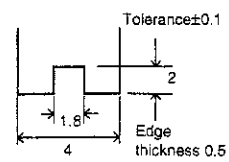
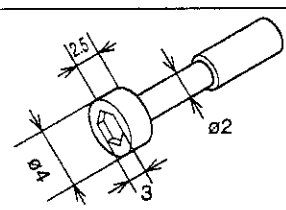
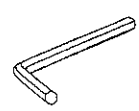
2) Set up the adjustment address (example : EEmode adjustment address 14). Once this address has been set up, the A/V IN mode (test mode) is automatically brought and the images appear on the LCD display.

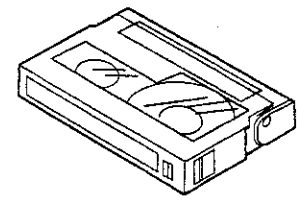
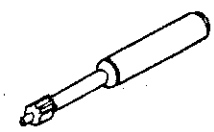
3) Now make the adjustments referring to the instruotions in the manual.

5. MECHANISM ADJUSTMENT

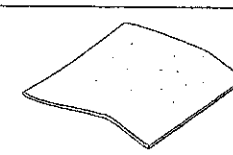
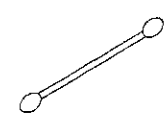
5-1. Mechanism checking/adjusting jigs, tools and parts

5-1-1. Mechanism checking/adjusting jigs and tools

No.	Name	Part No.	Code	Configuration	Model, Uses	Remarks
1	Cassette torque meter for PB	JiG8T-012	CV		• (10 g.cm/25 g.cm)	
2	Cassette torque - meter for VS-REW	JiG8T-032	CV		• (50 g.cm/25 g.cm)	
3	Torque gauge	JiGTG0045	CN		• For measurement of loading braketorque	
4	Torque gauge head	JiGTH-MX7U	BS		• For torque gauge listed above	
5	Torque driver (1.5 kg.cm)	JiGTD1500RT0H	CB			
6	Master plane	JiGMP-MX7U	CG		• For adjustment of Tu guide height • For adjustment of Si roller height • For checking of reel disk height	
7	Height adjusting jig	9DAGH-E31S	BM		• For adjustment of Tu guide height • For adjustment of Si roller height	
8	Guide roller height adjusting driver	JiGDRiVERHMX7U	BU		Bit shape (See the figure below) 	
	Tu guide height adjusting driver	9EQDRiVER-V712	BL			
9	Hex wrench(1.3mm)		—		• For loosening or tightening of Motor stator	

No.	Name	Part No.	Code	Configuration	Model, Uses	Remarks
10	Alignment tape	VR2ABOPS	BT	 TAPE CONTENTS: VIDEO IMAGE: MONOSCOPE; AUDIO: L-CH 400Hz, R-CH 1,000Hz; TIME: 30MIN		
11	Tension Band and Plate Adjusting Jig	JiGDRiVERMX7U2	BN			
12	Others (1) Slide clippers (2) High-precision screwdrivers (Phillips head, slotted head) (3) Radio pliers (with thin jaws) (4) A pair of tweezers					

5-1-2. Parts for periodic inspection and maintenance.

No.	Name	Part No.	Code	Configuration	Model, Uses
1	Oil 1) COSMOHYDRO HV100				• Cosmo Oil Co., Ltd.
2	Cleaning paper	JiGDUSPER	AP		• Dusper Σ (Sigma) (Ozu Co., Ltd.)
3	Superfine swab				• Commercially available item
4	Grease Morycoat YM-103/X5-6020				• Dow Coaning
5	Screw locking agent (1401B)				• Three Bond
6	Cleaning liquid (Industrial-use ethyl alcohol)				

5-2. Items and timings of inspection and maintenance

The mechanism of VCR needs the following periodic inspection and maintenance in order that it maintains its high quality. Also, after the machine is repaired, execute the following maintenance and checks regardless of how long it has been used.

5-2-1. Inspection and maintenance list

	Checking/Maintenance point	Usage time (hrs.)					Possible symptom encountered	Remarks
		500	1,000	1,500	2,000	3,000		
Tape travel system	Tape travelling route (Refer to Section)	□	□	□	□	□	• Lateral noise • Unclean head • Screen shaking	Rollers • If abnormal rotation or deflection (significant) is found, replace the roller. Other than rollers • Clean the tape contacting areas. Be sure to use the specified cleaning agent.
	Drum (Refer to Section)	□	□	□	□	□		
	Video head	□	□○	□	□○	□○	• Improper S/N ratio • No color appears.	
	Earth brush	—	★	★	★	★	• If significant brush nobbing noise is heard, replace.	
Driving system	Timing belt	—	★	—	★	★	• Tape does not run. • Tape slackens. • Screen shakes.	• Replace if failure is found.
	Pinch roller	□	□	□	□○	□		
	Capstan D.D. motor	—	○	—	○	○		
	Relay Pulle shaft Pulle gear shaft	—	Δ	—	Δ	Δ	• Abnormal sound	• Apply oil. (Oil: COSMOHYDRO HV100) Note: After oil is applied to the drive gear shaft, slightly wipe it off with swab.
	Drive gear shaft	—	Δ	—	Δ	Δ		
	Loading motor	—	★○	—	★○	★○	• Not ejectable • The specific mode cannot be set.	• Replace if failure (abnormal sound) is detected.
Performance check	Abnormal sound	★	★	★	★	★		• If conformance to the standard is not ensured, replace part.
	PB/VS-REW take-up torque	—	★	—	★	★		
	PB/VS-REW back tension torque	—	★	—	★	★		
	Tu brake	—	★	—	★	★		
	HC (Head Cleaner)	—	○	—	○	○		

Oil: COSMOHYDRO, HV100
Grease: MORYCOAT YM-103/X5-6020
Screw locking agent: THERE BOND 1401B
Cleaning liquid: Industrial-use ethyl alcohol

○ : Replace.
□ : Clean.
Δ : Apply oil.
★ : Check.

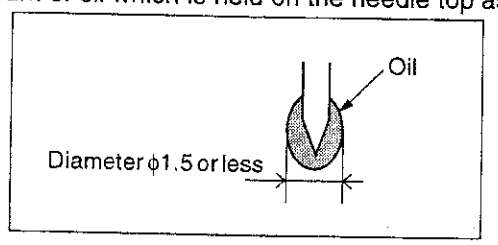
VL-E76

5-2-2. Notes and cautions

(1) Any cut washers, once removed for parts replacement or for other reason, must be replaced with new ones.

(2) The mechanism of this VCR does not involve any volume adjustment. If the specified range is not satisfied, either cleaning or replacing the parts is required.

(3) Oils
a) Be sure to use the specified oils (different viscosity may cause troubles).
b) For the bearings, be sure to use oil that is free form dust and other foreign substances. (Dust or foreign substance contained in the oil may cause wear or seizure of the bearings.)
c) A drop of oil represents the amount of oil which is held on the needle top as shown in the figure below.



(4) The circuit repair must be executed without removing the V frame.

(5) For operating the mechanism alone, actuate it with the motor. The terminal-to-terminal voltage must be DC4V or less.

(6) When installing the cassette control, press the part A shown below. Do not press other parts.

(7) Take care so that the whole mechanism is not deformed.

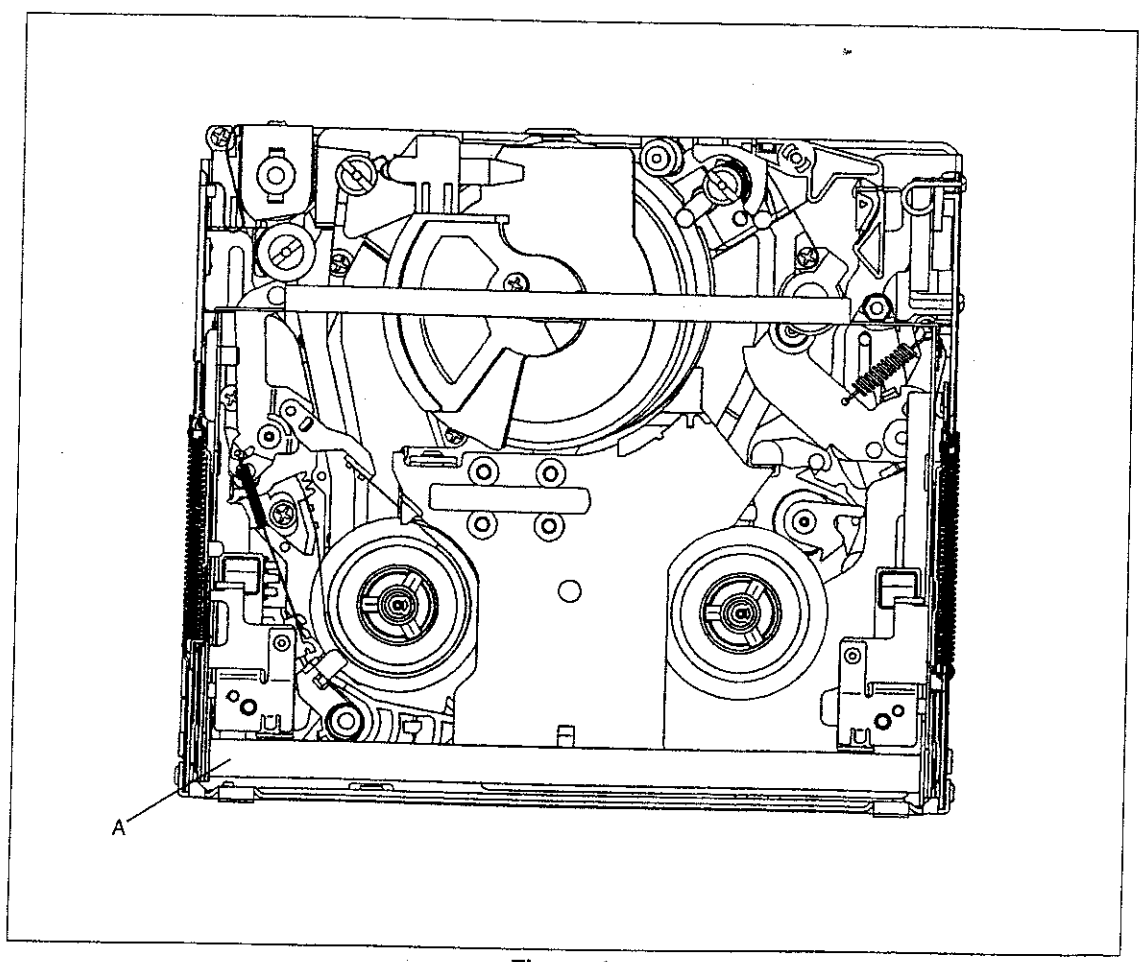


Figure 1

5-3. Mechanism checks and adjustments

The description given below relates to the general field services, but does not relate to the adjustment and replacement that require high level equipments, jigs, and technical skills.
In order to maintain the initial characteristics of the machine, it is necessary to execute the maintenance and check and to prevent damage to tapes and other parts. For adjustments which need jigs, be sure to use the jigs.

Notes and cautions

(1) For mechanism checks and adjustments, be sure to use the AC adapter as the power supply.

(2) For running the tape, be sure to install the cassette control ass'y in advance. (If the cassette control ass'y is to be removed subsequently after its installation.)

5-3-1. Checking the reel disk height

(1) Remove the cassette control ass'y.

(2) Taking due care not to let the master plane touch the tape running areas such as the drum and the guide rollers, position the master plane so that the two guides (A and B in the figure 1) are set in the holes of master plane, then properly set it in the mechanism.

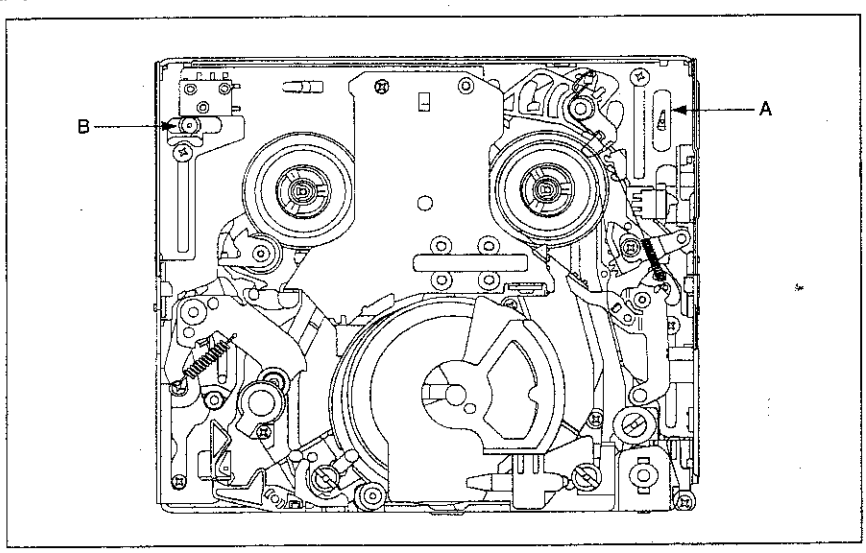


Figure 1

(3) Using the slide callipers or the like, check that the distance from the upper surface of master plane to the reel support surface of the S/Tu reel disk is within the specified range.

Note:
When measuring, do not apply excessive force to the reel support surface of reel disk.

(4) If the measurement is not within the specified range, replace the reel disk ass'y.

(5) Check the items (2) to (4) above in the following two modes.
a) Standby mode
b) Playback (recording) mode

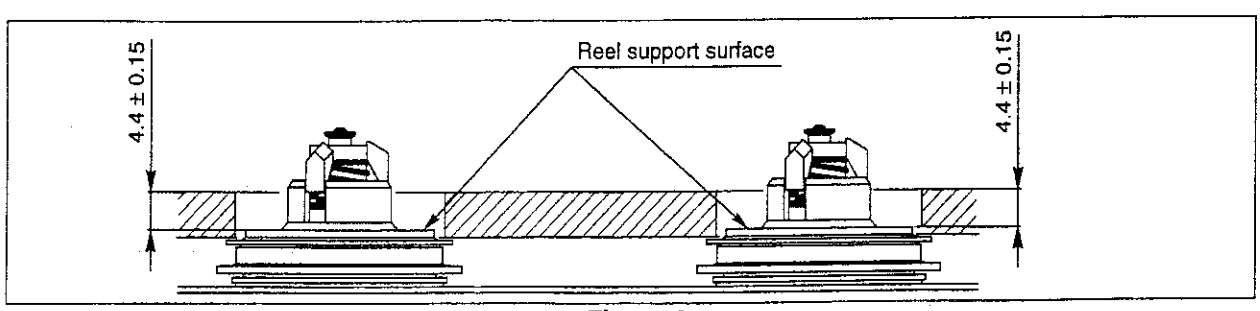


Figure 2

5-3-2. Checking the take-up torque for playback (recording)

(1) Set the torque cassette (8T-012) in position, and check in the SP-mode recording mode (tape recorded in SP mode) that the torque at the tape taking-up side is within the standard range.

Standard of take-up torque for SP-mode recording (playback)

9 ± 3 g.cm with ripples less than 4 g.cm
(If the torque ripples appear, read the center value of torque between the ripples.)

5-3-3. Checking and adjusting the back tension torque for playback (recording)

(1) Checking

1) Set the torque cassette (8T-012) in position, and check in the SP-mode recording mode (tape recorded in SP mode) that the torque at the tape supply side is within the standard range.

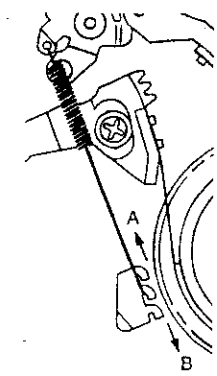
Standard of back tension torque for SP-mode recording (playback):

8 ± 2 g.cm with ripples of less than 2 g·cm
(Torque ripple must be within 8 ± 2g·cm)

(2) Adjustment

1) If the back tension torque is not within the standard range, adjust the tension spring hooking position. If the back tension is too high, hook the spring in the direction A. If the back tension is too low, hook the spring in the direction B.

Note:
1. After back tension torque adjustment be sure to check the tension pole position.



5-3-4. Checking and adjusting the tension pole position

(1) Check
When winding of P6-120 tape is started, check whether the tension pole is in the specified position against Si roller as shown or not.

If it is not in the specified position, remove the cassette and adjust the position in the following procedure.

(2) Adjustment

(2)-1. Don't set up any tape, and select the PB mode. (Refer to Item 5-5-1-(4).)

2. Slightly loosen the screw (1) (to such a strength as the T band holder B can be moved).

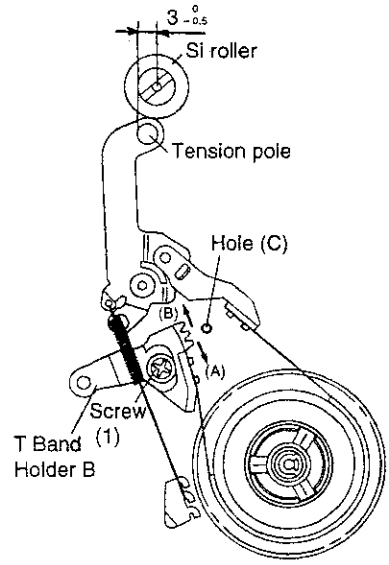
3. If the tension pole is in the inner position than specified, dislocate the T band holder B in the arrow (A) direction and if it is in the outer position, dislocate it in the arrow (B) position. Then, tighten the screw (1). (For reference, dislocate it 0.4 to 0.8 mm outer from the position specified above.) For the position adjustment, it is convenient to use the position adjustment screwdriver (JiGDRiVERMX7U2). (Set it in the hole (C).)

4. Check the position in the "(1) Check" procedure described above.

5. If it is not in the specified position, repeat the adjusting procedure 1 thru 3.

Note:

- Tightening torque of screw (1) 70 mN·m
- To check the position, be sure to run the tape.
- If the cassette compartment assembly is removed, it makes the work easier. (Refer to Item 5-5-3.)



5-3-5. Checking the take-up torque for rewind playback (VS-REW)

(1) Remove the cassette compartment ass'y and set to the sensor OFF mode.
(2) Set the torque gauge (TG0045) on the S reel disk, and check in the rewind playback (VS-REW) that the torque at the supply side is within the specified range.

Standard of take-up torque in rewind playback (SP mode)

31 ± 5 g.cm with ripples less than 5 g.cm.

(If the torque ripples appear, read the center value of torque between the ripples.)

5-3-6. Checking the back tension torque for rewind playback (VS-REW)

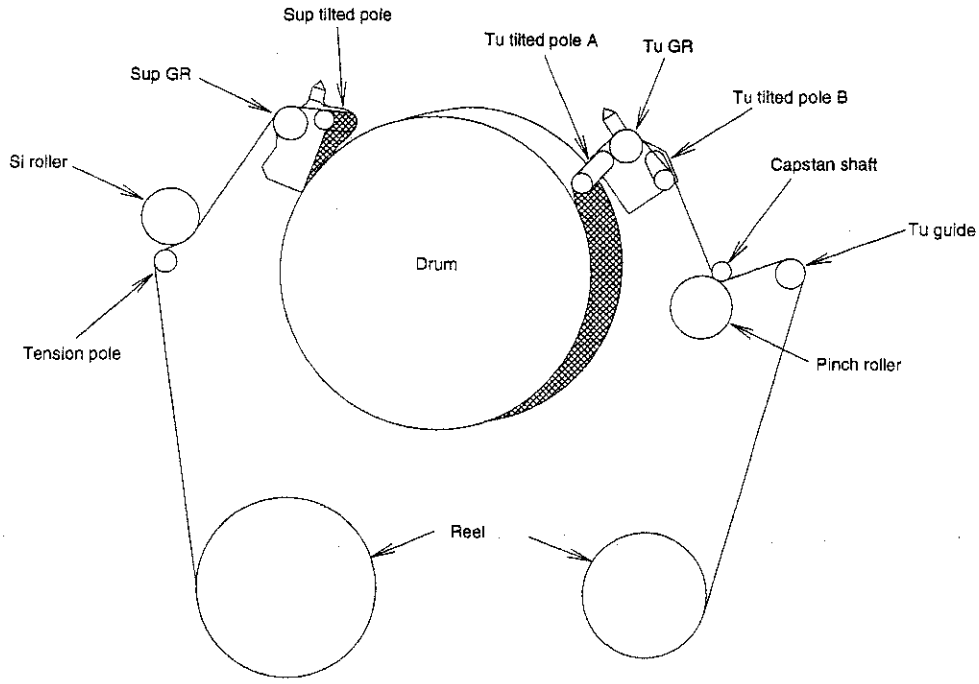
(1) Set the torque cassette (8T-032) in position, and check in the rewind playback (VS-REW) mode that the torque at the tape take-up side is within the specified range.

Standard of back tension torque in rewind playback (SP mode):

14 ± 5 g.cm with ripples less than 5 g.cm

(If the torque ripples appear, read the center value of torque between the ripples.)

5-4. ADJUSTMENT OF MECHANISM TAPE TRAVEL SYSTEM



Tape travel system (Figure 1)

5-4-1. Preparation for adjustment

(1) Clean the tape running areas (guide poles, rollers, drum, Capstan shaft, Pinch roller) (Figure 1)

(2) Connect the oscilloscope to the following TPs.
RF output ... TL3306
H-SW-P TL405
GND TL3318

(3) Playback the alignment tape (VR2ABOPS).

(4) Ascertain that each guide is free from remarkable curl.

(5) Ascertain that the RF waveform of inlet and outlet sides is flat on the oscilloscope (Figure 2, (a)). Unless the waveform is flat, (Figure 2, (b), (c)), make an adjustment as follows.

5-4-2. Adjusting the Sup GR and Tu GR

(1) Turn the Sup and Tu guide rollers to get the flat waveform at the inlet and outlet sides.

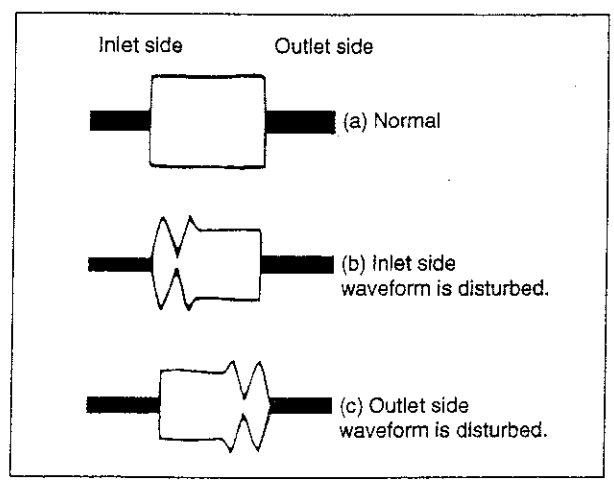


Figure 2

5-4-3. Adjusting the Si roller height

After replacement of Si roller preset and adjust the Si roller height.

(1) Si roller height presetting
Adjust the height from the upper surface ofmechanism chassis to the upper surface of lower flange with the aid of jig. Then lower it by 90° (clockwise).

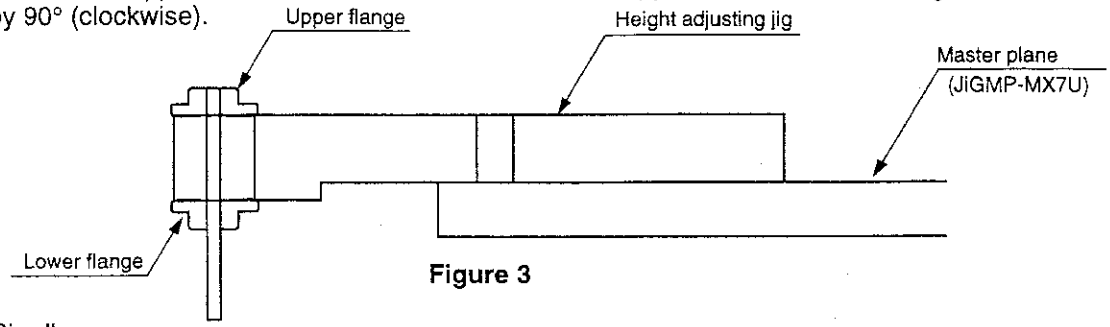


Figure 3

(2) Adjusting the Si roller

1 Playback the thin tape such as P6-120MP to set the V/SR mode.

2 Ascertain that the tape is not folded on the lower flange (2) of Si roller (1). (Figure 4)
If tape folding is found, turn the upper flange (3) of Si roller (1) with the driver (clockwise) to eliminate the folding.

3 Playback the alignment tape (VR2ABOPS).

4 Adjust the Sup GR and Tu GR by the procedure described in section 4-2 above.

5 After V/S F,R perform playback so as to ascertain that the waveform rises horizontally within 2 seconds.

6 Unless the normal waveform is obtained (Figure 5), turn counterclockwise the upper flange (3) of Si roller (1), and repeat the step (5) above. Repeat the steps (5) and (6) until the normal waveform is obtained. At this time ascertain that the inlet travel does not change in the normal playback state. If any change is found, adjust the Sup GR, and redo the step (5).

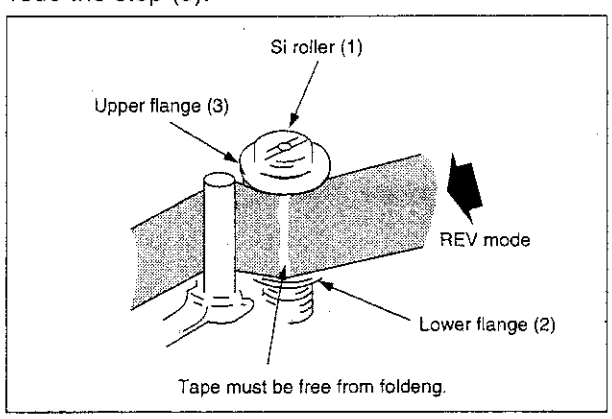


Figure 4

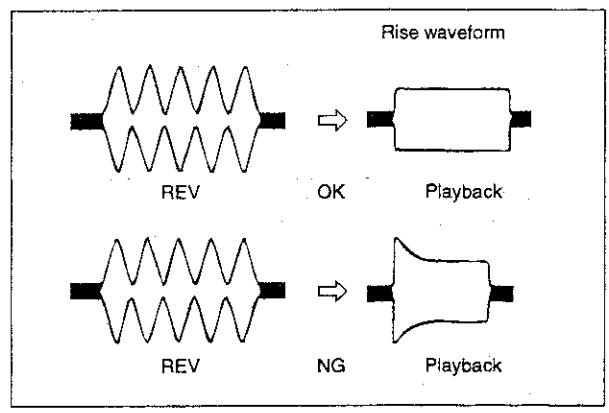


Figure 5

5-4-4. Adjusting the Tu guide

After replacement of Tu guide preset and adjust the height.

(1) Tu guide height presetting

Adjust the height from the upper surface of mechanism chassis to the upper surface of lower flange with the aid of jig.

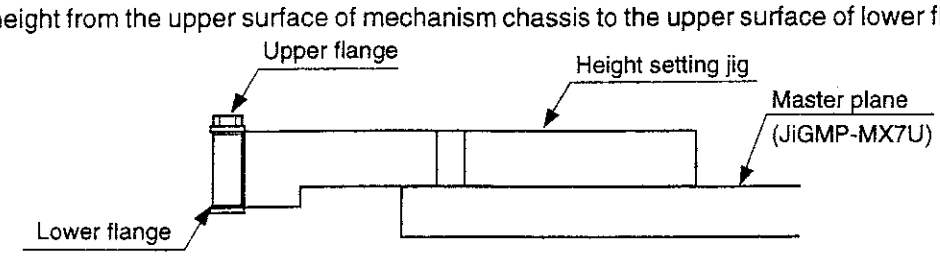


Figure 6

(2) Adjusting the Tu guide

1 Playback the Tu guide adjustment cassette (or the No.7 guide adjustment cassette for E30).

2 Check that the tape runs at the same height near the capstan shaft in case of V/S F and V/S R.

3 If the tape running position in case of V/S R is higher than the tape running position in case of V/S F, turn clockwise the Tu guide nat.
If the tape running position in case of V/S R is lower than the running position in case of V/S F, turn counterclockwise the Tu guide nat.

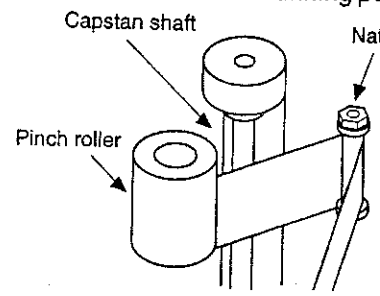


Figure 7

5-4-5. Checking the V/S F and R waveforms

(1) Playback alignment tape (VR2ABOPS), and set the V/S R mode. At this time ascertain that the waveform crest pitch is kept constant for more than 5 seconds.

(2) Set the V/S F mode. At this time ascertain that the waveform crest pitch is kept constant for more than 5 seconds. Unless the constant pitch is obtained, execute the checks of Section 4-2, 3, and 4.

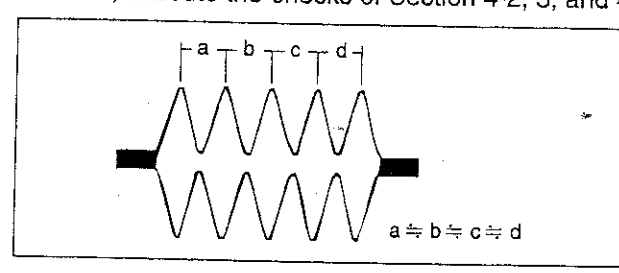


Figure 8

5-4-6. Checking after adjustment

(1) Envelope check

1 Playback the alignment tape (VR2ABOPS).

2 Ascertain that the envelope maximum to minimum ratio is 65% or more. (Figure 9)

3 Ascertain that the waveform does not change remarkably. (Figure 10)

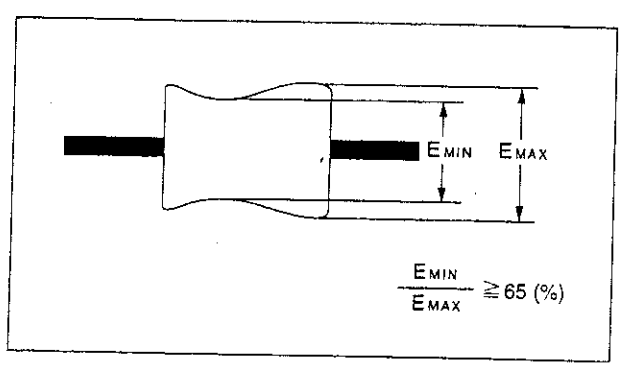


Figure 9

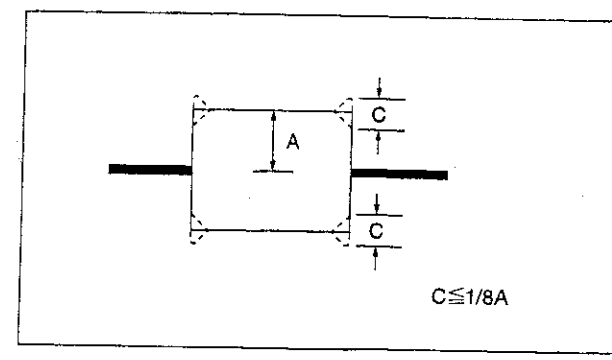


Figure 10

(2) Rise check

1 Playback the alignment tape (VR2ABOPS).

2 Once eject the cassette, and then load it again.

3 Set the playback mode, and ascertain that the RF waveform rises horizontally within 2 seconds. At this time ascertain that there is no tape slackness near the pinch roller.

4 After V/S F, R and FF/REW execute playback, and ascertain that the RF waveform rises horizontally within 2 seconds. At this time ascertain that there is no tape slackness near the pinch roller.

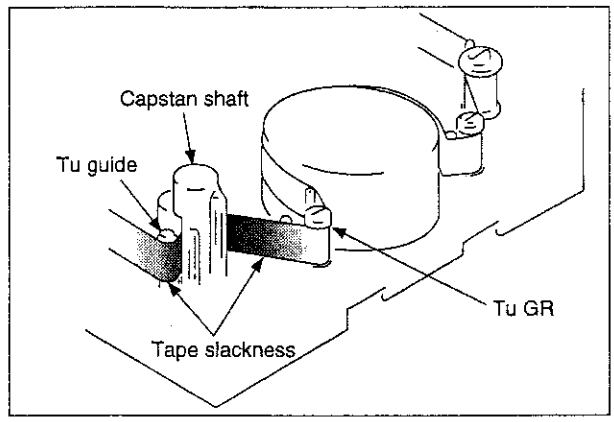


Figure 11

(3) Checking the tape travel

1 When the thin tape such as P6-120MP is played back, ascertain that tape lift and tape curl of 0.3 mm or more do not occur at the lower flange of Si roller, upper flange of Sup GR, upper flange of Tu GR, and upper/lower flange of Tu guide.

2 In case of V/S F and R ascertain that no curl is found at each flange.

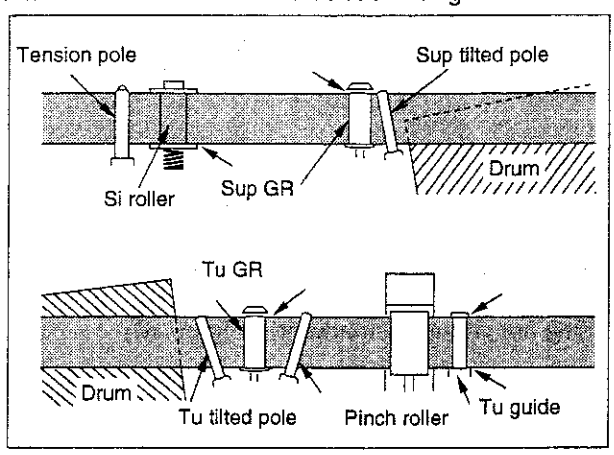


Figure 12

5-4-7. Checking and adjusting the playback switching point

Refer to the description of playback switching point adjustment in section of VCR circuit adjustment.

VL-E76

5-5. Mechanism assembling and parts replacement (disassembling and assembling)

Below is given an explanation of assembling of mechanism and its parts replacement.

The removal of cabinet and Circuit Board is explained in the relevant service manual.

Notes

1 After removal of cut washers be sure to replace them with new ones.

2 Do not place the mechanism upside down on the table. Otherwise, the mechanism part may be deformed or damaged, resulting in malfunction.

3 When assembling, take care so that screw, washer or other foreign substance do not enter. Otherwise mechanism malfunction may occur.

4 Be sure to use the specified cleaning liquid, oil, grease and screw lock as listed below. Otherwise mechanism malfunction may occur.

Oils: 1) Cosumo Oil Co., Ltd.
COSMOHYDRO HV100

Greases: Dow Coaning
MORYCOAT YM-103/X5-6020

Screw lock: THREE BOND
1401B

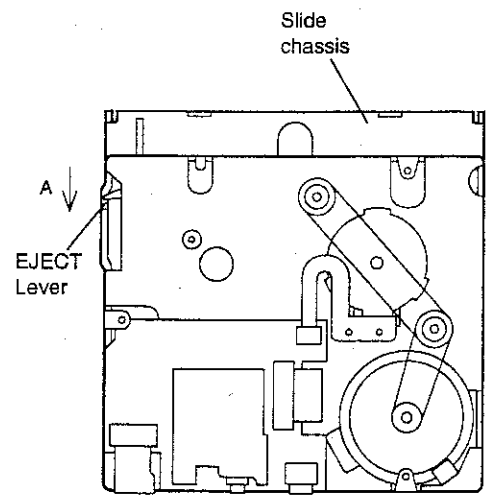
Cleaning liquid: Industrial-use ethyl alcohol

5-5-1. Mechanism modes

To actuate the mechanism, apply DC3 to 4V to the L motor ((2) in Figure 4). At this time the L motor connector must have been disconnected in advance.
Below is given an explanation of the mechanism mode necessary for mechanism check, adjustment and replacement.

(1). EJ (Eject) mode (See Figure 1)

In this mode, it is mechanically positioned to eject the cassette. It is the position where the EJECT lever is moved the farthest in the direction A in the S/B mode. (In this mode, the cassette compartment assembly can not be locked.)

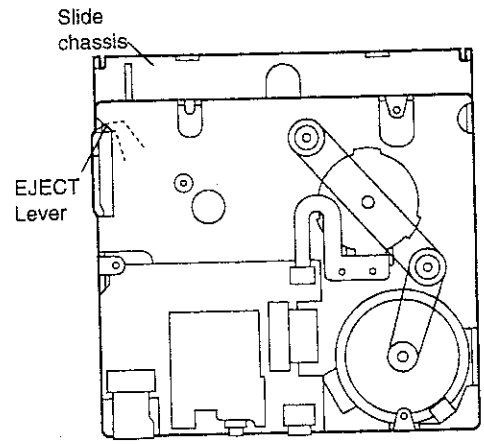


EJ mode

Figure 1

(2). S/B (Standby) mode (See Figure 2)

When the cassette is loaded, the mechanism is set to the S/B mode. In this mode the slide chassis is most far from the drum. In this mode the Eject lever is in position shown in Figure 2 (in position where the cassette control ass'y can be locked).

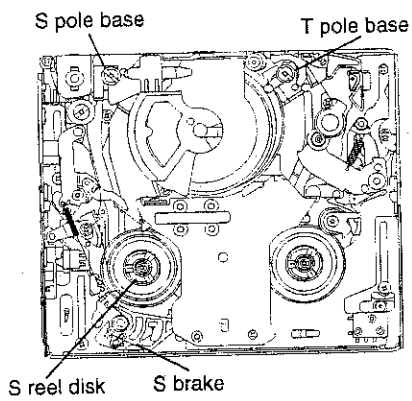


S/B mode

Figure 2

(3). STOP mode (See Figure 3)

In the STOP mode the S.T pole base is depressed in the STOP position (or Rec Lock position in CAMERA mode), and the S brake is in contact with the S reel disk.

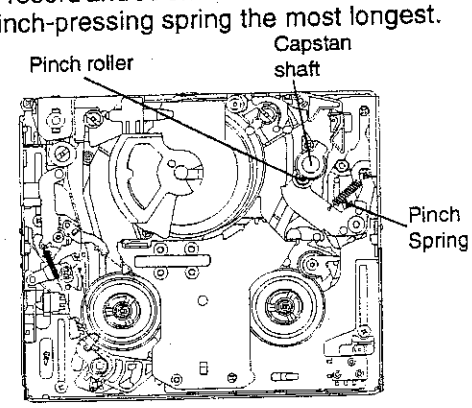


STOP mode

Figure 3

(4). PB mode (See Figure 4)

In this mode, it is positioned for the replay, record and so on. It is the mechanical position where the pinch roller is pressed against the capstan shaft to make the pinch-pressing spring the most longest.



PB mode

Figure 4

5-5-2. Cassette control ass'y

<Disassembling>

(1) Set the unit to the EJECT mode, and let the housing stand upright. Or set the unit to the STANDBY mode, press the lock lever in the arrow direction, and let the housing stand upright. (See Fig 5: in the direction ⓐ or ⓑ) (When pushing in the direction ⓐ, slightly lift the housing by hand to release the lock lever.)
(2) Remove the four screws ② and take out the down guide ③.
(3) Slide the two link support shafts ⓒ and the two roller shafts ⓓ to the round openings ⓖ on their respective slide chassis slits (two at ⓔ and two at ⓕ).
(4) Deflect the roller shafts ⓓ a little inward to get them out of the round openings ⓖ on the slide chassis. (Be careful not to deform the inner links.)

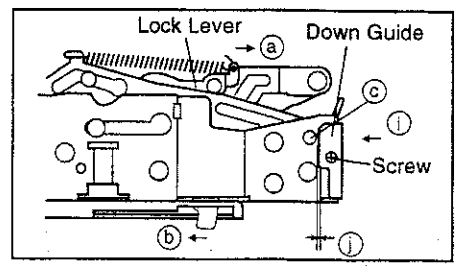


Figure 5. Lock lever section

Screw tightening torque (4 locations) 0.069±0.007 N·m (0.7±0.07kg·cm)

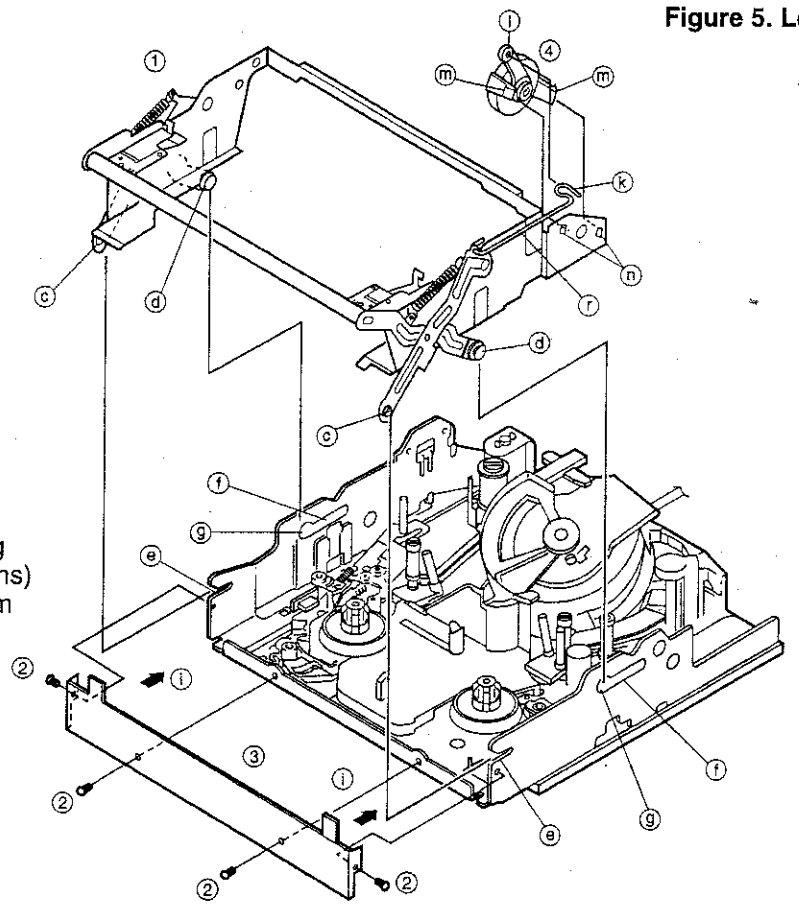


Figure 6.

<Reassembling>

(1) Set the unit to the STANDBY mode.
(2) Deflect the roller shafts ⓓ a little inward, and fit them into the round openings ⓖ on the slide chassis. (Be careful not to deform the inner links.)
(3) Align the flanges of roller shafts ⓓ with the slide chassis slits ⓕ. While sliding the flanges, fit the support shafts ⓒ in the slide chassis slits ⓔ, and slide them until they reach the slits.
(4) Attach the down guide. (While pressing the guide in the direction ⓘ, tighten the screws until the gap ⓙ between the down guide ③ and the support shafts ⓒ becomes zero.)
Tightening torque: 70±7 mN·m (0.7±0.07 kg·cm)

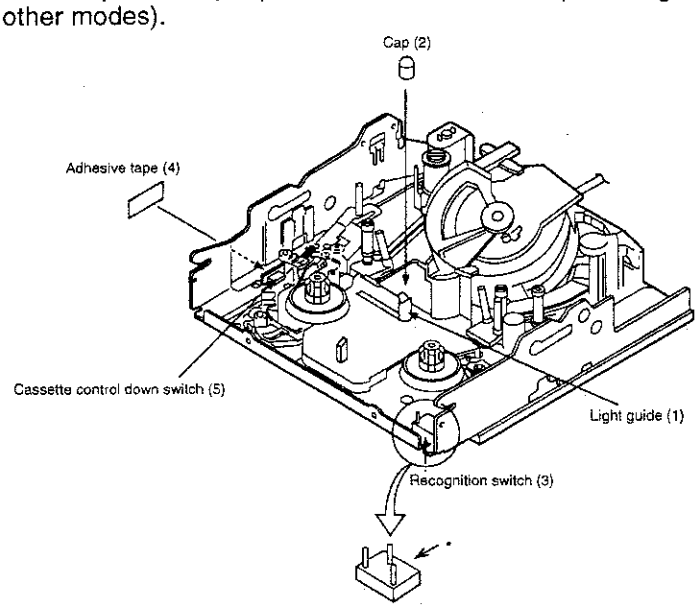
5-5-3. Actuating the mechanism with the cassette control ass'y removed

(1) Turn on the power supply with the cabinet and camera unit removed, referring to the Service Manual (so as to actuate the mechanism).

(2) Put the cap (2) on the light guide (1).

(3) Press the cassette control down switch (5) through the adhesive tape (4) in the arrow direction so as to turn it on. At this time take care to avoid contact with the cassette. Keep the switch pressed (if the switch is turned off, unloading occurs).

Note: To set the Rec mode, press the pin (marked with the asterisk *) of recognition switch (3) (this operation is not necessary in other modes).



5-5-4. Drum and Drum base

Removal

* To replace the upper drum, be sure to put on gloves. Due care is required so that the drum is not damaged.

(1) Drum base

Remove the 3 mounting screws as shown in Figure 1, and remove the drum base.

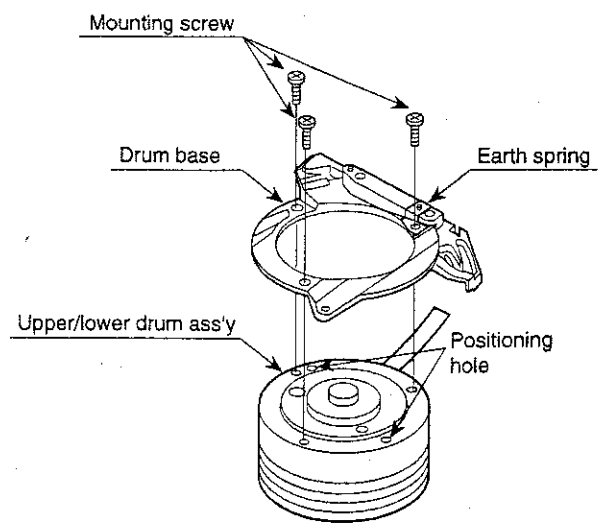


Figure 1

(2) Drum motor stator

Remove the stator mounting screw with the hexagonal wrench as shown in Figure 2, remove the motor stator.

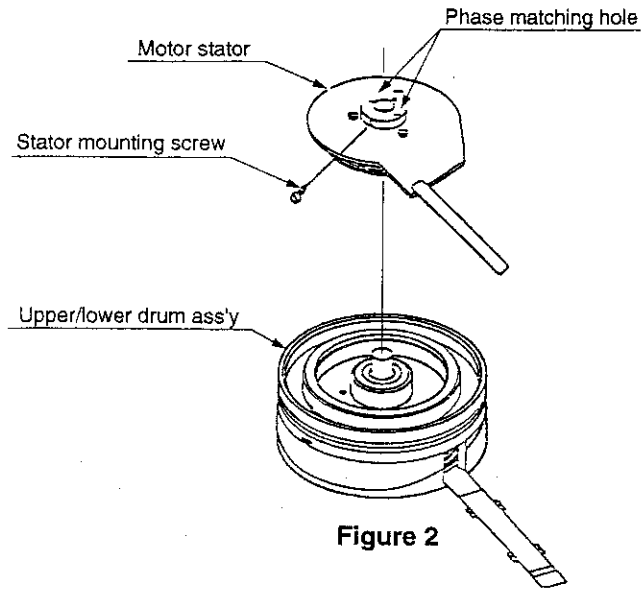


Figure 2

(3) Upper drum ass'y

Remove the upper drum ass'y from the lower drum ass'y as shown in Figure 3.
At this time take care so as not to lose the gap shim.

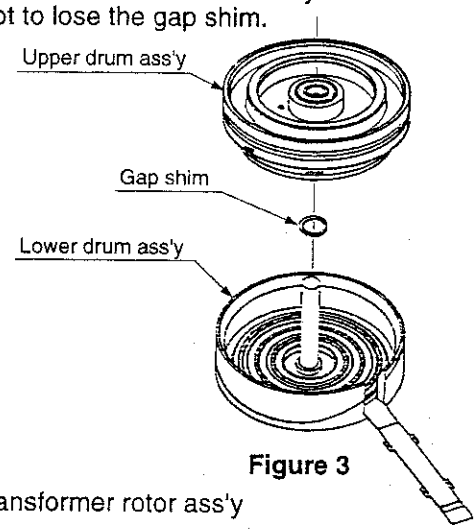


Figure 3

(4) Motor rotor ass'y and rotary transformer rotor ass'y

Remove the 2 rotor mounting screws as shown in Figure 4, and remove the motor rotor and the rotary transformer ass'y.

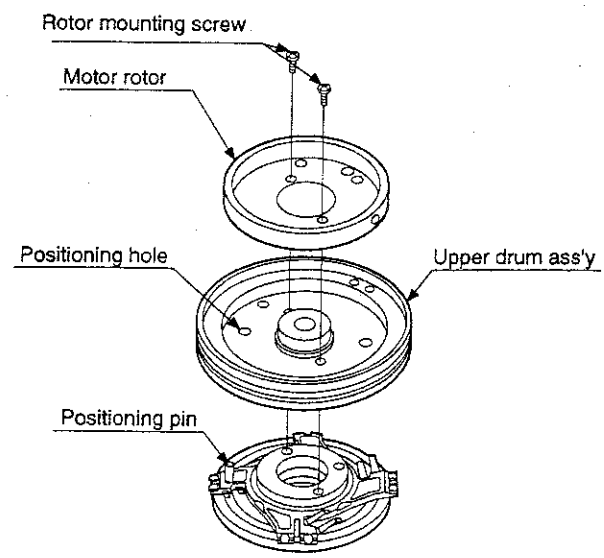


Figure 4

(5) Balancer

Remove the balancer mounting screw as shown in Figure 5, and remove the balancer.

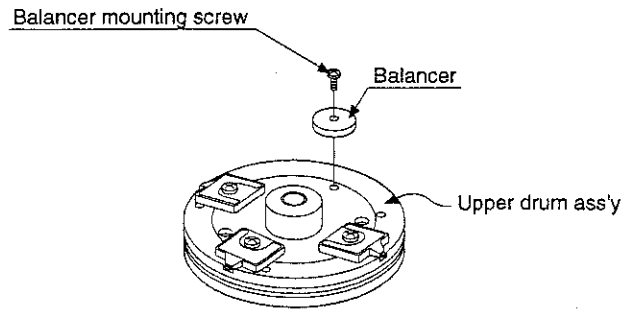


Figure 5

(6) Lower drum ass'y

Remove the FPC mounting screw from the lower drum ass'y as shown in Figure 6.

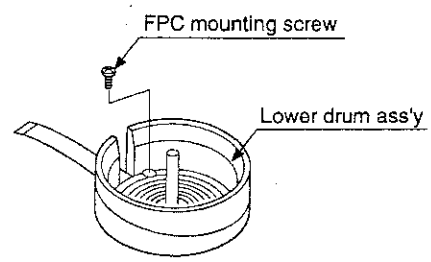


Figure 6

Installation

Install the upper drum in the reverse order of removal.

(1) Balancer

Mount the balancer to the upper drum ass'y with the balancer mounting screw. The screw tightening torque must be 0.1N·m (tighting torque 1kg·cm). (Figure 5)

(2) Motor rotor, rotary transformer rotor ass'y

Clean the contact surfaces of rotor ass'y holder and upper drum ass'y, and ascertain that there are no contamination and flaws.
Next, adjust the phase so that the positioning pin of rotor ass'y is inserted into the positioning hole of upper drum, and tight fit the rotor ass'y to the lower surface of upper drum ass'y (Figure 7).

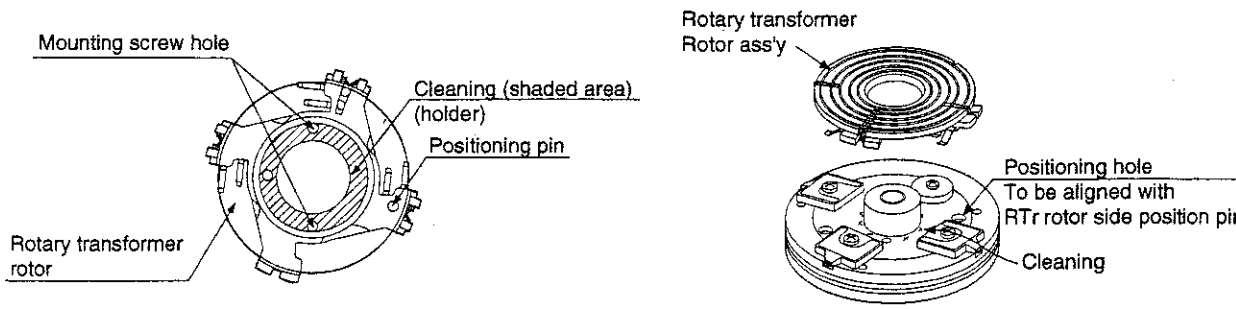


Figure 7

In this state put the motor rotor on the upper surface of upper drum ass'y, and tighten the mounting screw. At this time make sure that the head screw in the three places is visible through the motor rotor hole (Figure 8). The screw tightening torque must be 0.1N·m (1 kg·cm).

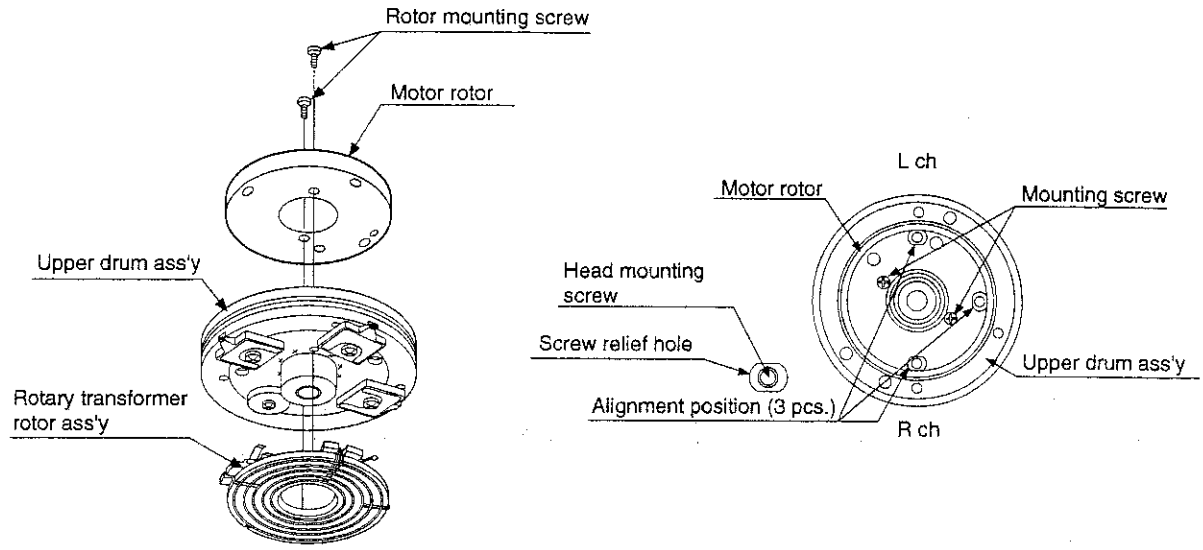


Figure 8

(3) Lower drum ass'y

Tighten the FPC mounting screw to the lower drum ass'y. The screw tightening torque must be 0.08N·m (tighting torque 0.8kg·cm). (Figure 6)

(4) Upper drum ass'y

After fitting the gap shim which was removed when the upper drum ass'y was dismantled to the shaft of lower drum ass'y, fit the upper drum ass'y. (Figure 3)
At this time slightly turn the upper drum ass'y by hand to ascertain that RTr does not scrape. If scrape is found, replace the gap shim with the gap shim packaged together with the replacement upper drum ass'y.

(5) Drum motor stator

Fit the motor stator to the shaft. Then, apply the preliminary pressure 0.07N·m (0.7kg) to the motor stator, tighten the stator mounting screw. The tightening torque must be 0.15N·m (1.5kg·cm).
Install the stator so that the chassis line is nearly parallel with the motor stator straight section when it is installed on the chassis. (Figure 9)

(6) Drum base

Align the positioning pin, and tighten the screws (3 pcs.).

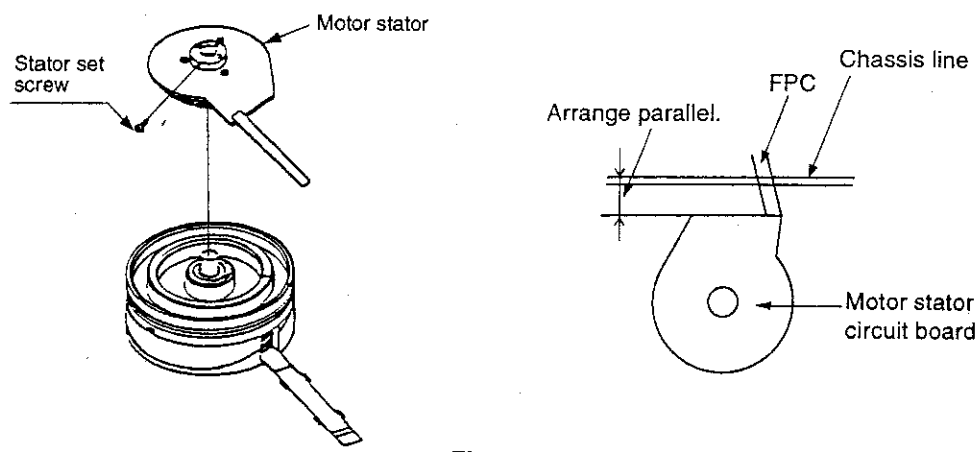


Figure 9

(7) Drum ass'y

Install the drum ass'y on the main chassis, and tighten the screws (3 pcs.).

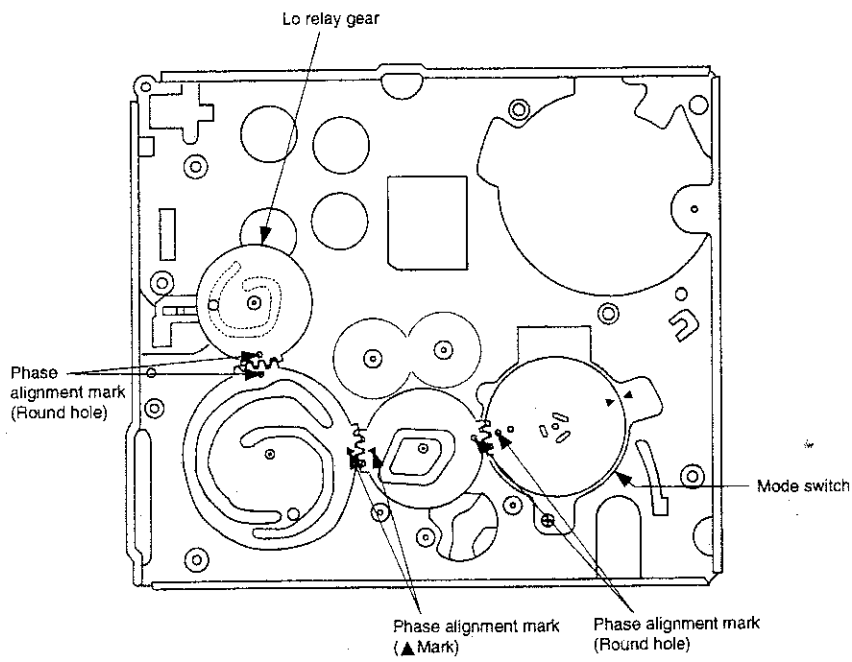
(8) Tape guide

Align the positioning pin, and tighten the screw (one pc.).

5-5-5. Phase matching

The phase of the following parts must be matched as shown in the figure below.
(Ascertain that the ▲ marks and round holes align.)

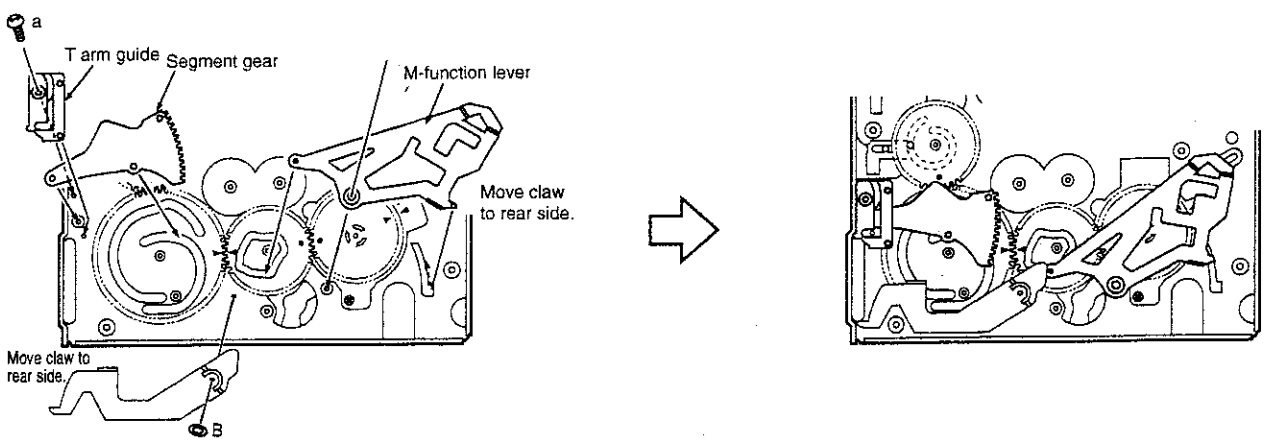
(1) Lo relay gear (2) Main cam (3) Sub-cam (4) Mode switch



5-6. MECHANISM ASSEMBLING METHOD

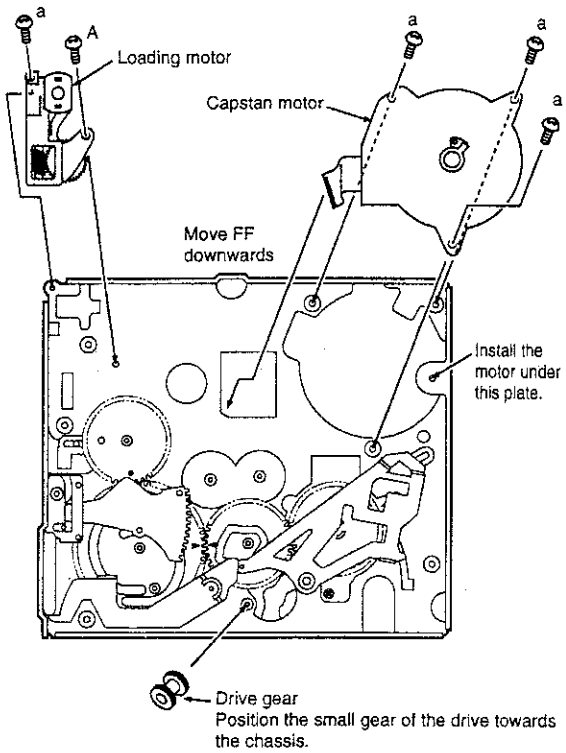
(1) Adjust the phase of each part.
(2) Install screws and washers.
(3) Install the segment gear, T arm guide and the M-function lever. Install the eject lever.

	Item	Tightening torque	Quantity
a	S Tight M1.4 x 3	70mN·m (0.7kgf·cm)	1
B	ø0.8-ø3.0-t0.2		1

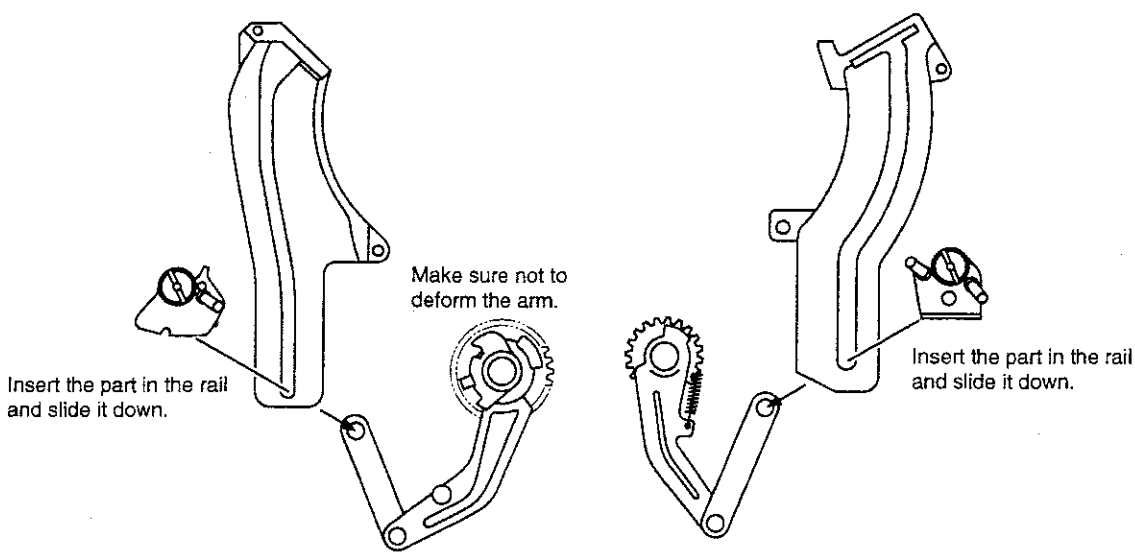


(4) Install the loading block assembly and the capstan motor.
(5) Install the drive gear. At this time, pay attention to the direction of gear. (The small gear must be located in the chassis side.)

	Item	Tightening torque	Quantity
A	S Tight M1.4 x 2.5	70mN·m	1
a	S Tight M1.4 x 3	70mN·m	4

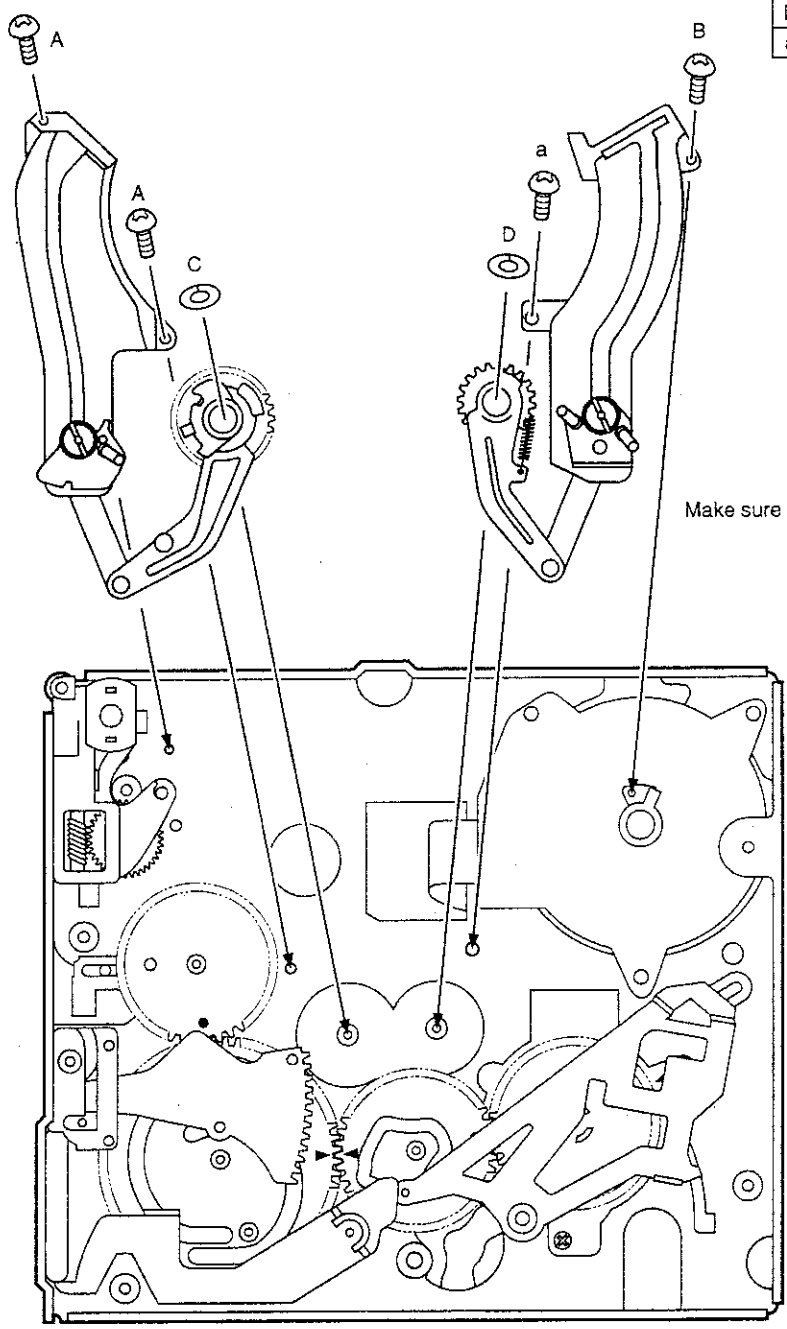


(6) Install the guide rail assembly.



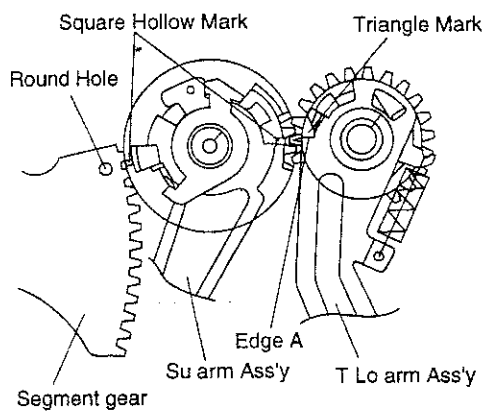
(7) Install the guide rail assembly taking care to position it correctly.

	Item	Tightening torque	Quantity
A	S Tight M1.4 x 2.5	70mN·m	2
B	S Tight M1.4 x 4	40mN·m	1
C	ø0.8-ø3.0-t0.2		1
D	ø2.1-ø5.0-t0.25		1
a	S Tight M1.4 x 3	70mN·m	1



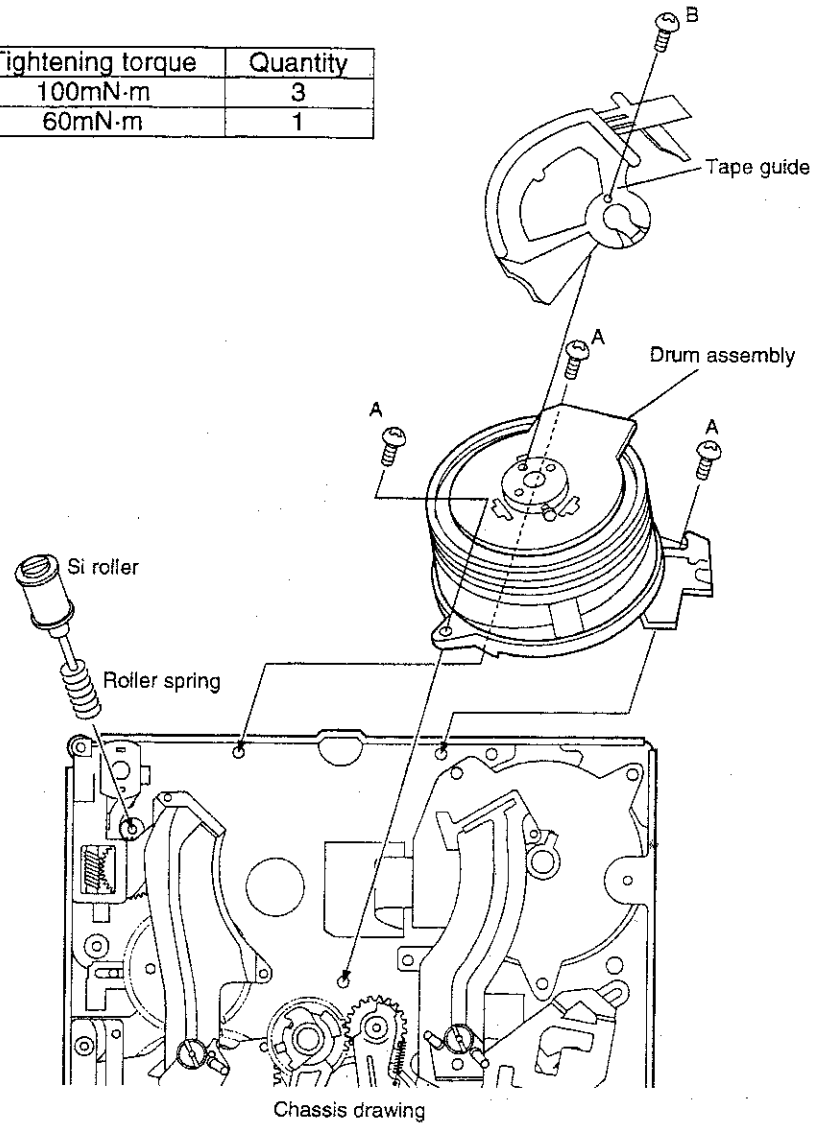
Make sure not deform the arm.

Align the marks on the parts.

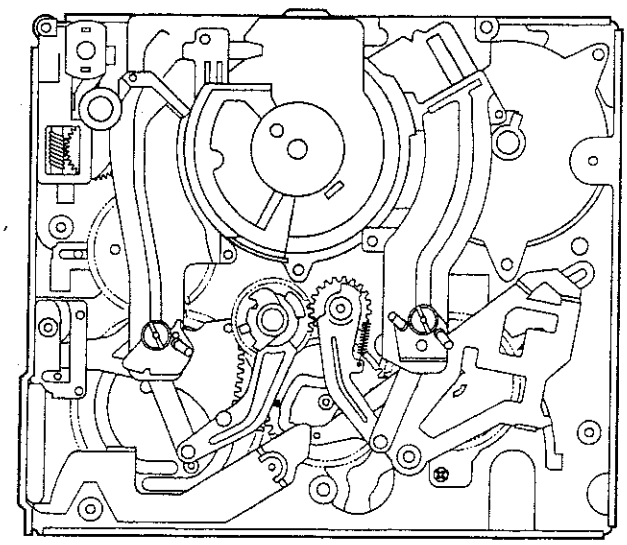


(8) Install the drum assembly in the chassis.
(9) Install the tape guide in the drum assembly.
(10) Install the Si roller.

	Item	Tightening torque	Quantity
A	S tight M1.7 x L5.3	100mN·m	3
B	S tight M1.7 x L2.5	60mN·m	1

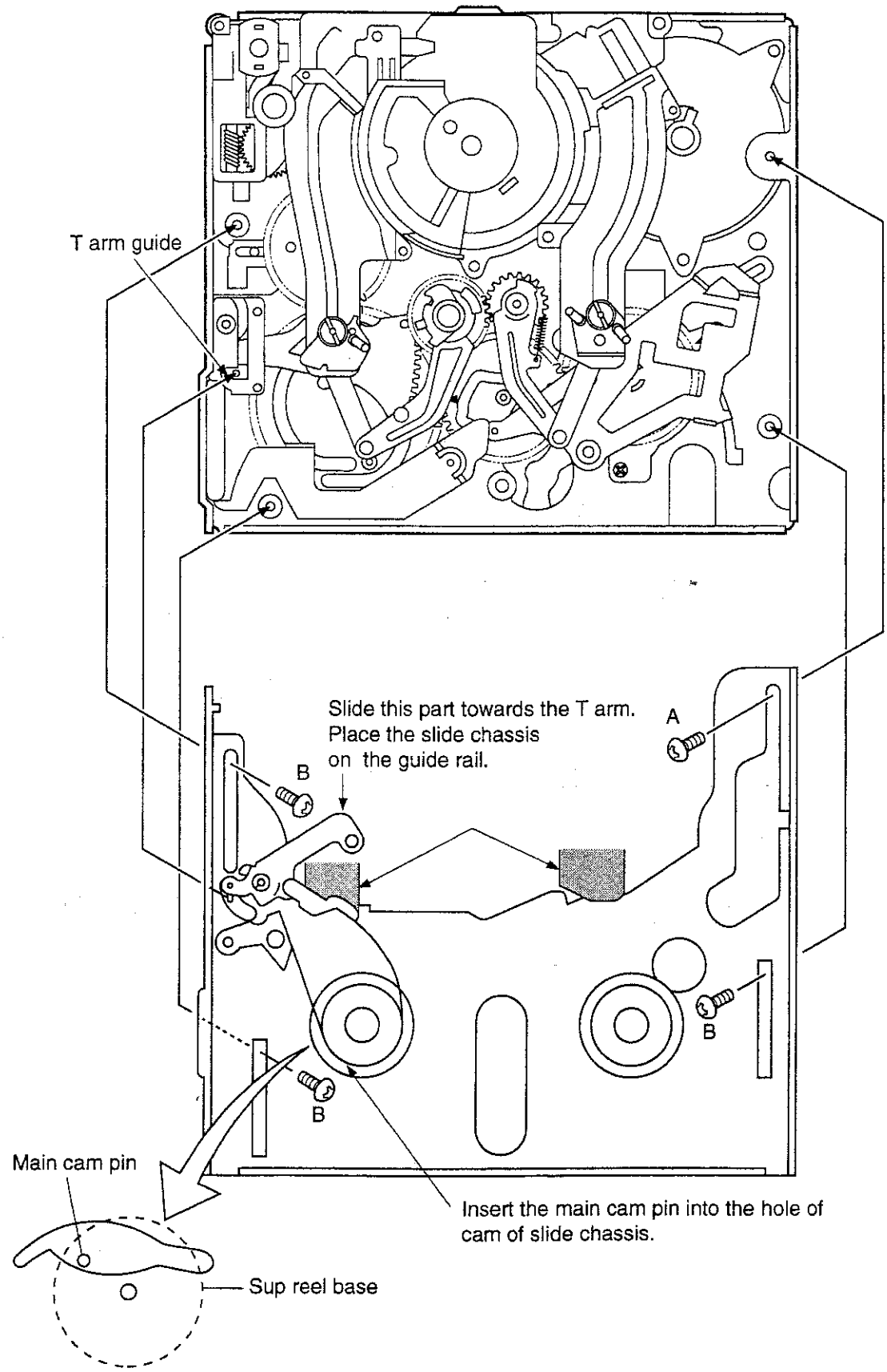


Chassis drawing



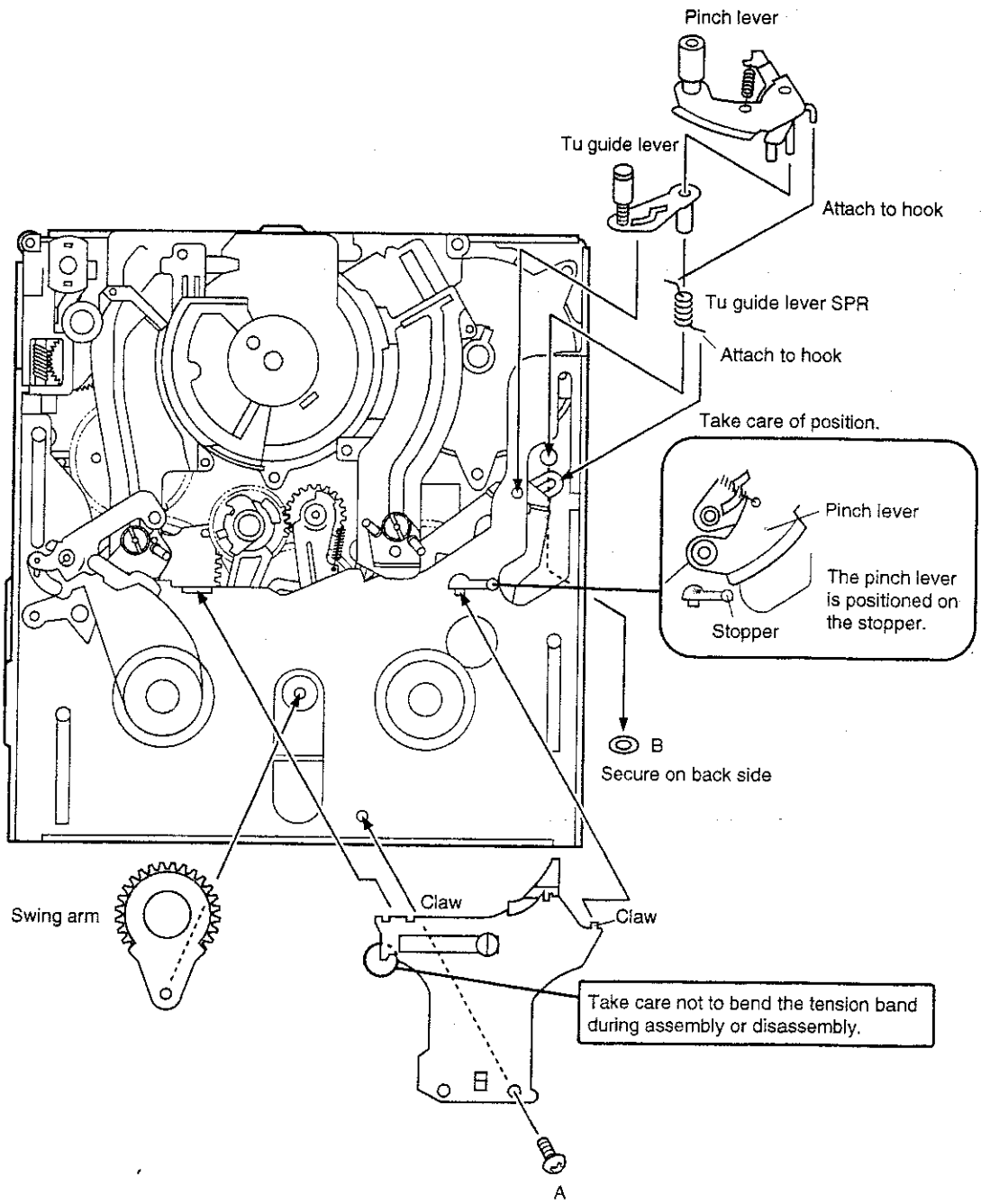
(11) Install the slide chassis.

	Item	Tightening torque	Quantity
A	M1.4 x 1.5 ø4.0	40mN·m	1
B	M1.4 x 1.5 ø3.5	40mN·m	3



(12) Install in the following order: T guide lever spring, T guide lever, pinch lever.
(13) Install the swing arm.
(14) Install the right guide holder.

	Item	Tightening torque	Quantity
A	S tight M1.4 x 2.5	70mN·m	1
B	CW ø0.8-ø3.0-t0.2	70mN·m	1



6. ADJUSTMENT OF VCR

6-1. ADJUSTMENT OF VCR SECTION

6-1-1. Before starting the electric circuit adjustment

- Electric circuit adjustment becomes necessary, in most cases, when any of the wear mechanical parts or the video head has been replaced. Before starting the electric circuit adjustment, be sure to check that the mechanical parts work well (i.e., the mechanical parts have all been perfectly adjusted). In case a trouble or troubles are found in the electric circuitry, be sure to pinpoint the cause(s) by using the measuring instruments described below. After locating the trouble spot(s), then proceed to repair, replacement or adjustment. Do not change the positions of the controls when adequate measuring instruments are not available.
- In order to implement a higher-density, smaller machine, most of the electric circuit parts used on the Circuit Boards are of small-sized, surface-mounted type. For replacing part(s) as after-sales service, work with a soldering iron as speedily as possible. The heat resistance of the surface-mounted components is poor, when compared with the larger-sized discrete parts used for television sets and stationary decks, owning to their small sizes. Therefore, exercise due care to avoid long-time exposure of the pins of these parts to the heat of the soldering iron which may possibly damage them. Such care should be exercised especially for chip-layer capacitor replacement. It is advisable to use a temperature-controlled ceramic soldering iron (temperature at the tip: 250°C, contacting time: less than 5 seconds).

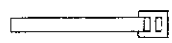
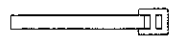
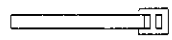
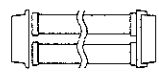
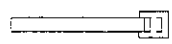
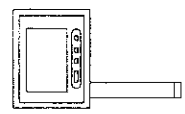
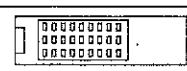
< Adjusting the video/LCD section >

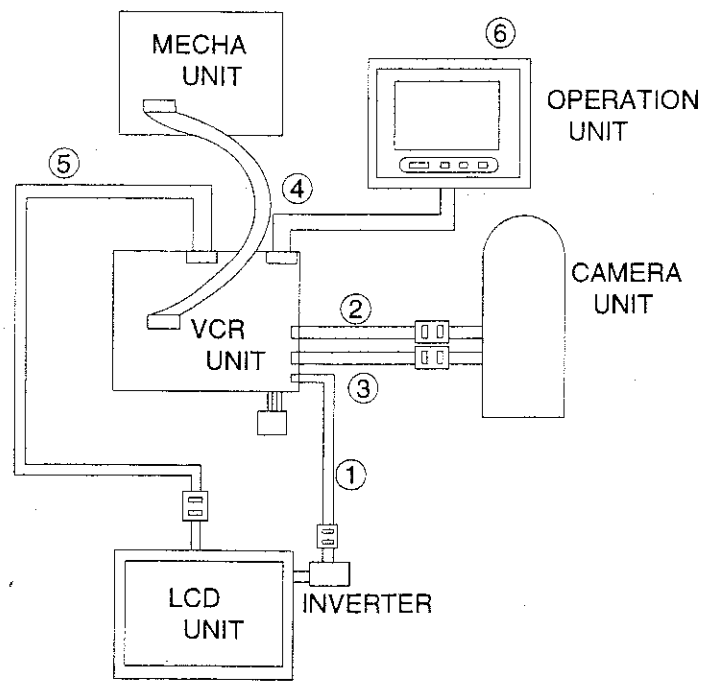
- Measuring instruments:
  - *Color monitor TV set
  - *Digital voltmeter
  - *DC power supply
  - *Audio generator (CR oscillator)
  - *Alignment tape (JiGWR5-5NSP)
  - *AC adapter
  - *AV output cable (accessory)
  - *Oscilloscope
  - *Vector scope
  - *Frequency counter
  - *Signal generator (NTSC pattern generator LCG-401/401YC: Leader-made)
  - *Video recording tape (For Y/C, audio and servo adjustments)
  - *DC cable (AC adapter accessory)
  - *Video extension cables

6-1-2. Servicing the VCR section Adjustment

6-1-2-1. Typical connections

Extension Cable etc.

NO.	NAME	PART NO.	Code	CONFIGURATION	REMARKS
1	Extension Cable Inverter~VCR (7pin)	QCNW-1265TAZZ	AX		
2	Extension Cable Camera~VCR (17pin)	QCNW-1380TAZZ	BD		
3	Extension Cable Camera~VCR (15pin)	QCNW-1311TAZZ	BA		
4	Extension Cable MECHA~VCR (70pin)	QCNW-1534TAZZ	BS		
5	Extension Cable LCD~VCR (24pin)	QCNW-1382TAZZ	BD		
6	Operation Unit	QSW-Z0287TAZZ	AR		
7	Connector fitting and withdrawing extractor				insulating sleeve
8	Connector fitting and withdrawing tweezers	9EQPINSET06GE	BR		
9	Service remote control	RRMCG0033TASA	BT		



• Types of test modes

TEST No.	Title	Contents	Sensor on/off
1	Sensors off	All sensors but the cassette controller switch, dew sensor and battery sensor stay off.	
3	Automatic battery sensor adjustment	Battery sensor's input voltage put in memory.	
4	Battery adjustment error display	Battery sensor's adjustment errors are displayed at the right of the "past errors" area.	All sensors on All but sensors on
5	PASS mode	Track shift mode (1/4 shift)	All sensors on
6	Camera adjustment mode	Camera adjustment mode	[VCR interrupted]
7	VCR adjustment mode	VCR adjustment mode	
8	Automatic switching point adjustment (STOP ADJ)	Play standard tape and call this mode. Switching point is automatically adjusted.	

① When the battery adjustment mode is selected from the camera adjustment mode with a cassette with the erase protection tab, the VCR is automatically put in the REC mode.

• Below discussed are these seven test modes.

① [TEST No. 1] Sensors off mode
All the sensors, except for the cassette controller switch, dew sensor and battery sensor, stay off. This enables to bring the VCR in the loading mode without tape. The VCR/camera performance can now be checked with no tape inside.

② [TEST No. 3] Automatic battery alarm adjustment
Used to automatically adjust the voltage level which makes the "battery" appear on the LCD display.

③ [TEST No. 4] Battery alarm check/error display
• The difference between the preset battery alarm voltage and the current supply voltage is displayed as follows.
• A past error is displayed at the right of the current battery alarm error.

④ [TEST No. 5] PASS mode
Used to adjust the tape travelling condition. The tracking is shifted by 1/4 from the center to make the tape running-related RF envelope fluctuations easier to observe.

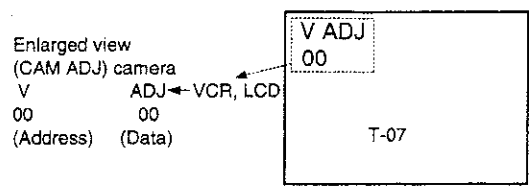
⑤ [TEST No. 6] Camera adjustment mode
Used to adjust the camera section. (For details, see Servicing the Camera Section.)

⑥ [TEST No. 7] VCR adjustment mode
Used to adjust the VCR section. (For details, see Servicing the VCR Section.)

⑦ [TEST No. 8] Automatic switching point adjustment
Used to automatically adjust the playback switching point. (For details, see Automatic Adjustment of the Playback Switching Point.)

6-1-2-2. Setting up the VCR section adjustment mode (camera section adjustment)

• Select adjustment items by using addresses. Rewrite the adjustment data to change the settings. Below shown the adjustment procedures and on-screen display.



	Procedural steps	Display (: flashing)
①	Turn up or down the flashing hexadecimal number with the FF or REW key to select the address of a desired adjustment item. (Initial address: 00H) Note: The addresses change as follows. 7E — 7F — 00 — 01 — 02	V ADJ
②	Press the PB key to read the data of the selected address.	V ADJ 2C A3
③	Turn up or down the data setting with the FF or REW key. The data display starts flashing.	V ADJ 2C
④	Press the PB key again to write the data setting into the selected address.	V ADJ 2C 72
⑤	Press the STOP key in the above step ② or ④, and the screen returns back to the step ①.	V ADJ

When the FF or REW key is held down for 0.3 second or longer, the address selection is repeated in cycles of 100 msec. The data setting changes by ± 4 by holding the key down for 2 seconds or longer.

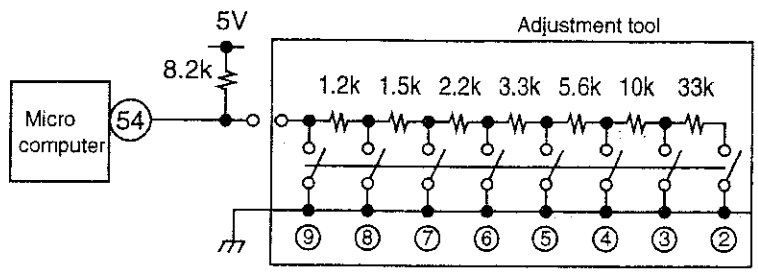
6-1-2-3. Battery shut-off voltage adjusting method

1) Supply power to the main unit, using the variable-voltage DC power supply (range of 2.5V to 5V).
2) Set the CAM/OFF/VCR SW to CAM to switch to the camera mode.
3) Load a recordable tape and set the main unit to CAM REC. PAUSE.
4) Set the main unit to TEST mode No. 3, and start recording.
5) Measure voltage between TL901(+) and TL903(GND), and adjust the supply voltage to 3.0V.
6) The adjustment is complete if "BATTERY" is displayed on the monitor screen for a second when the PLAY key of operation unit is pressed.
7) The adjustment is regarded as proper if the auto shut-off is actuated after the warning is displayed when the TEST mode is cancelled.

* In case of automatic adjustment of shut-off voltage, adjustment is impossible if voltage is above 3.0V ± 0.2V. If the adjustment is made at 2.9V or below, the low-voltage operation may become unstable.

• Types of test modes

Any of the eight test modes can be set up by changing the input voltage at pin (54) of IC703. During any test mode, the REC Start/Stop commands are not accepted.



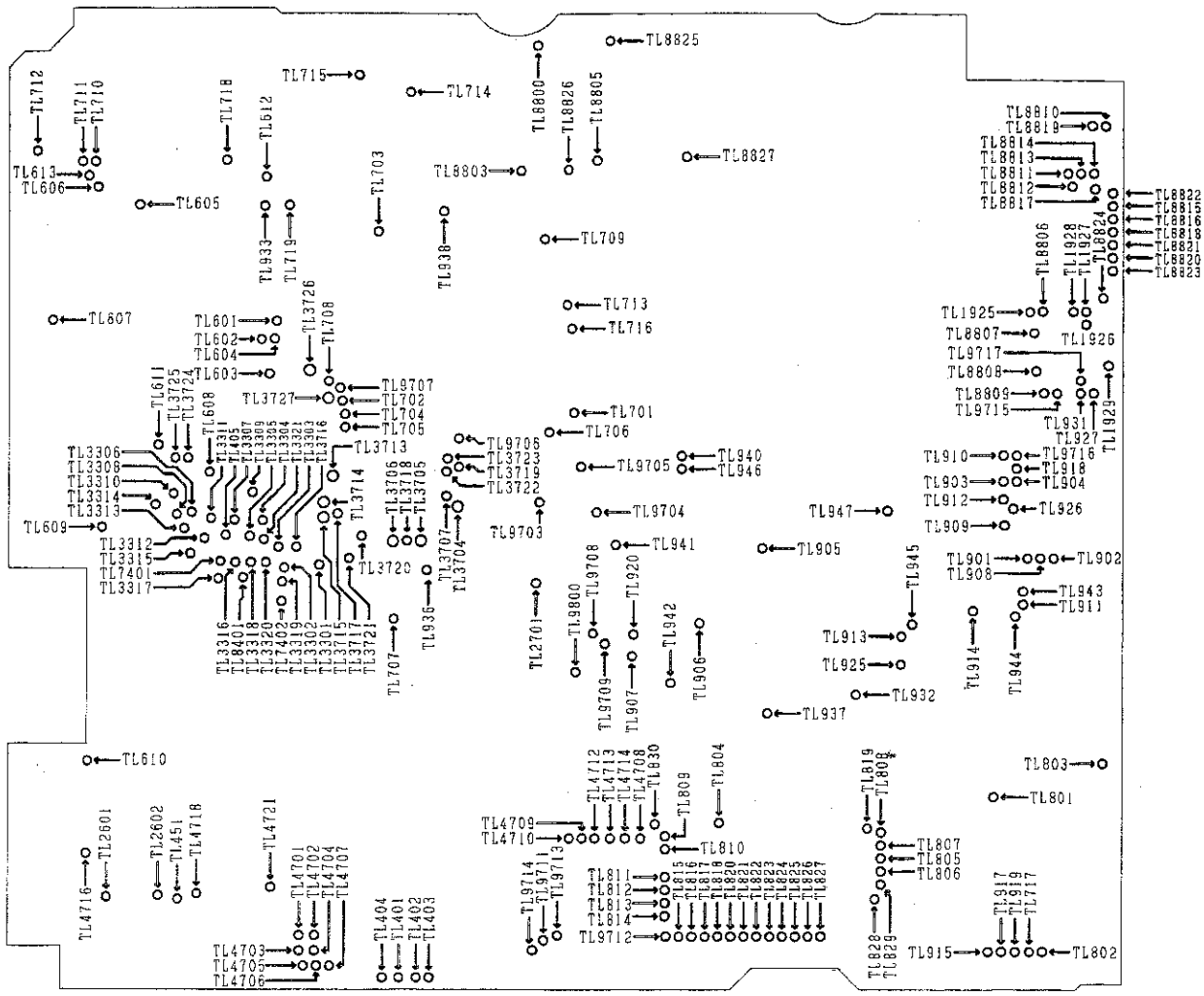
Use the SW2 thru SW9 switches on the adjustment tool to select the following test modes.

SW No.	Title	Contents	Sensor on/off
2	Sensors off	All sensors but the cassette controller switch, dew sensor and battery sensor stay off.	
3	Mechanism adjustment mode	① Automatic SP/LP detection prohibited ② Different-mode detection prohibited ③ ATF sampling limited to center	All sensors on
4	Automatic battery sensor adjustment	Battery sensor's input voltage put in memory.	
5	Error display Battery adjustment error display	Past errors appear on the counter display of the viewfinder. Battery sensor's adjustment errors are displayed at the right of the "past errors" area.	All sensors on All but sensors on
6	PASS mode	Track shift mode (1/4 shift)	All sensors on
7	Camera adjustment mode	Camera adjustment mode	[VCR interrupted]
8	VCR adjustment mode	VCR adjustment mode	
9	Automatic switching point adjustment (STOP ADJ)	Play standard tape and call this mode. Switching point is automatically adjusted.	

① When the battery adjustment mode is selected from the camera adjustment mode with a cassette with the erase protection tab, the VCR is automatically put in the REC mode.

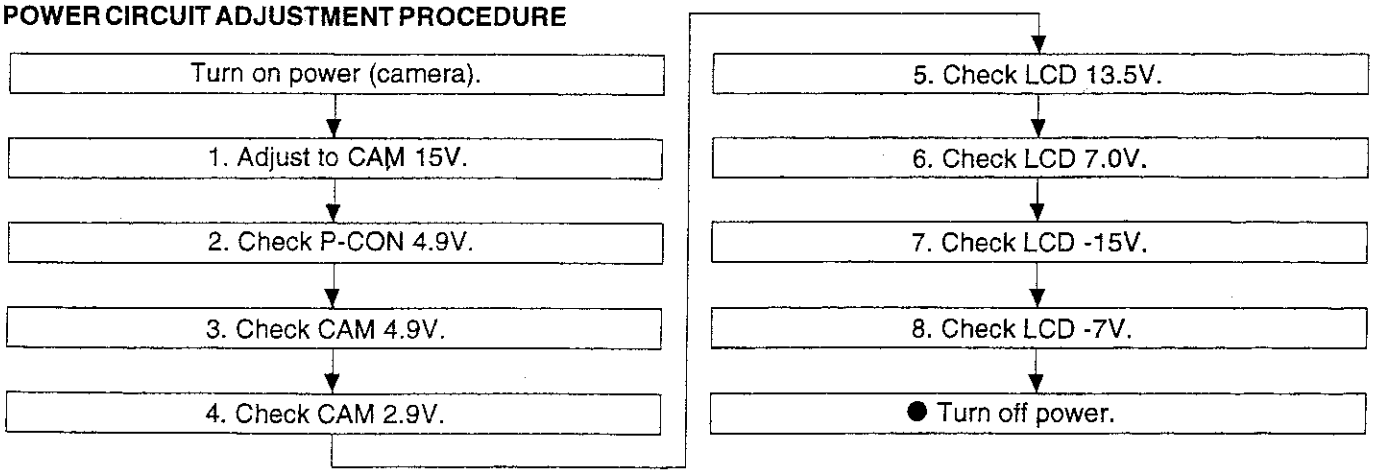
6-1-3. Adjusting the VCR circuit

• Test Points on the Video Circuit Board



6-1-3-1. Adjusting the power circuit

POWER CIRCUIT ADJUSTMENT PROCEDURE


Turn on power (camera).
1. Adjust to CAM 15V.
2. Check P-CON 4.9V.
3. Check CAM 4.9V.
4. Check CAM 2.9V.
5. Check LCD 13.5V.
6. Check LCD 7.0V.
7. Check LCD -15V.
8. Check LCD -7V.
● Turn off power.

POWER CIRCUIT ADJUSTMENT METHOD

● Input 6V from the battery terminal, and set the power switch to the camera side.

1. Adjustment to CAM 15V

1) Make an adjustment so that the digital voltmeter indicates 15.0V ± 0.05V.

Measuring instrument	Digital voltmeter
Measuring terminal	TL910
Adjustment address	20H
Standard	15.0V ± 0.05V

2. Checking of P-CON 4.9V

1) Check that the digital voltmeter indicates 4.9V ± 0.1V.

Measuring instrument	Digital voltmeter
Measuring terminal	TL905
Adjustment address	
Standard	4.9V ± 0.1V

3. Checking of CAM 4.9V

1) Ascertain that the digital voltmeter indicates 4.9V ± 0.1V.

Measuring instrument	Digital voltmeter
Measuring terminal	TL906
Adjustment address	
Standard	4.9V ± 0.1V

4. Checking of CAM 2.9V

1) Ascertain that the digital voltmeter indicates 2.9V± 0.1V.

Measuring instrument	Digital voltmeter
Measuring terminal	TL931
Adjustment address	
Standard	2.9V ± 0.1V

5. Checking of LCD 13.5V

1) Ascertain that the digital voltmeter indicates 13.5V ± 0.2V.

Measuring instrument	Digital voltmeter
Measuring terminal	TL913
Adjustment address	
Standard	13.5V ± 0.2V

6. Checking of LCD 7.0V

1) Ascertain that the digital voltmeter indicates 7.0V ± 0.25V.

Measuring instrument	Digital voltmeter
Measuring terminal	TL914
Adjustment address	
Standard	7.0V ± 0.25V

7. Checking of LCD -15V

1) Ascertain that the digital voltmeter indicates -15.2V ±1.0V.

Measuring instrument	Digital voltmeter
Measuring terminal	TL909
Adjustment address	
Standard	-15.2V ± 1.0V

8. Checking of LCD -7V

1) Ascertain that the digital voltmeter indicates -7V ± 0.5V.

Measuring instrument	Digital voltmeter
Measuring terminal	TL911
Adjustment address	
Standard	-7V ± 0.5V

● Turn off power supply.

6-1-4. Adjustment of system controller and servo circuit

6-1-4-1. Adjustment of playback switching point

1) Play back the alignment tape (JiGWR5-5NSP)
2) Press the "CONTINUOUS PUSH" and "TEST MODE SELECTION" of adjustment remote controller to set the test mode.
   At this time the numeral of "TEST01" blinks.)

Measuring instrument	Oscilloscope
Mode	Playback
Adjustment address	30h
Tape	Alignment tape (JiGWR5-5NSP)

3) Using the "FF" and "REW" keys, select "TEST08", and press the playback key to set the SW-P adjustment mode.
4) After a while the adjustment is completed, and operation stops automatically.
   In case of adjustment failure the tape is ejected automatically.

Only in the case when the satisfactory result was not obtained by the adjusting method described above, perform the following adjustment.

1) Connect each signal to the oscilloscope.
   1ch: Video output ... TL801
   2ch: H-SW-P TL405
   GND: GND TL802
2) Play back the alignment tape (JiGWR5-5NSP)
3) Press the "CONTINUOUS PUSH" and "VCR ADJUSTMENT" of adjustment remote controller to set the VCR adjustment mode.
4) Select the address 30h, set the sync slope of oscilloscope to (–), adjust the data with "REW" and "FF" so that the interval between the trigger point and the V sync signal is set to 6H, and fix the data with the "PLAY" button. (See Figure 6.1.1.)
5) Then, set the sync slope to (+), and ascertain that the interval between the trigger point and the V sync signal has been set to 6H. (See Figure 6.2.2.)
6) Keep the STOP key pressed for about 3 seconds to exit from the adjustment mode.

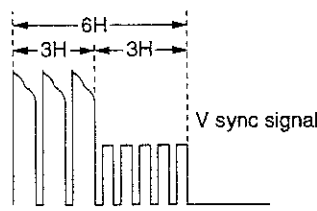


Figure 6.1.1

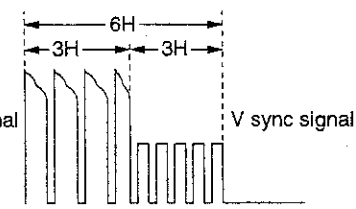


Figure 6.2.2

6-1-5. Y/C circuit adjustment method

Input signal conditions

Video signals generated by a pattern generator are used to make electric adjustments in a Y/C circuit. Thus this signal must conform to the standards prescribed for adjustment signals.
Use an oscilloscope to check that the video signal is terminated with a 75 Ω resistor, the amplitude of the sync signal component, video component and burst signal are approx. 0.3 Vp-p, 0.7 Vp-p and 0.3 Vp-p, respectively and that they are flat. The relative level of the burst signal and the red signal shall be 0.30:0.66.
The color bar used in an electrical adjustment is shown in Figure A.

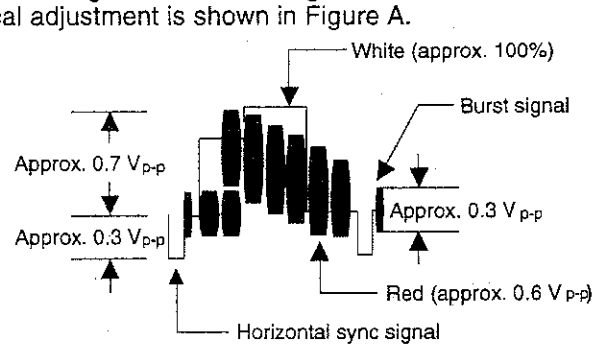


Figure A Color bar signal produced by a pattern generator

*** When a pattern generator is not used**

Shoot a color bar chart (JiGCHART-4) using a perfectly adjusted video camera.
A signal from a perfectly adjusted video camera shooting a color bar chart (JiGCHART-4) can be used as an adjusting signal if the lighting can be set to meet the following conditions: output (75 Ω terminated), the amplitude of the sync signal component, video component and burst signal are approx. 0.3 Vp-p, 0.7 Vp-p and 0.3 Vp-p, respectively. The relative level of the burst signal and the red signal shall be 0.30:0.66. This is shown in Figure B.

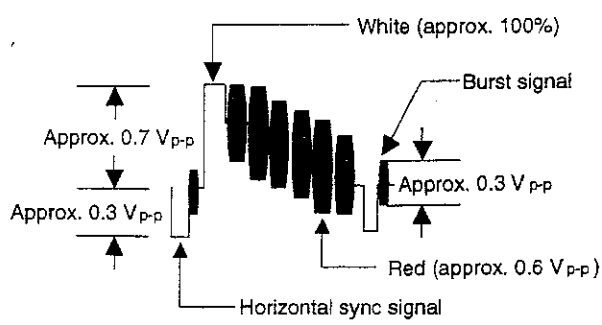


Figure B Color bar signal produced by a video camera

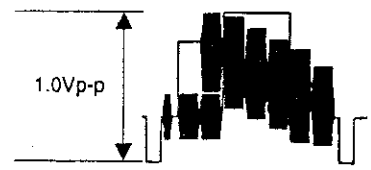
1. Adjustment of fixed data writing

ADD	DATA
23	00
25	00
26	D0

(1) Before starting Y/C adjustment, be sure to write the specific data in the addresses listed left.
If the data listed left is written after Y/C adjustment, adjusting values may deviate.
* Before starting Y/C adjustment, write 00 to the address 31.
* At the end of Y/C and LCD adjustment, write FF to the address 31.

2. Adjustment of input Y level

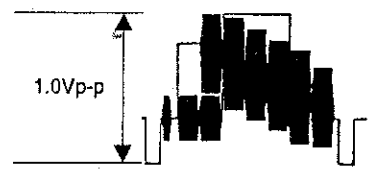
Measuring instrument	Oscilloscope
Mode	VCR STOP
Input signal	Color bar
Measuring point	TL801
Adjustment address	32
Adjustment level	1.0 Vp-p ± 40 mVp-p



(1) Input the color bar signal into the video input/output terminal in the VCR STOP mode.
(2) Enter the VCR adjustment mode with an adjustment remote control, and select the address 32.
Select the address, using the FF or REW key, and fix it with the PB key.
(3) Make an adjustment so as to get 1.0 Vp-p between SYNC TIP and WHITE PEAK on TL801.
Select the data, using the FF or REW key, and fix it with the PB key.
After the adjustment, press the STOP key, and exit from the adjustment address 32.

3. Adjustment of playback Y level

Measuring instrument	Oscilloscope
Mode	PB
Playback signal	Color bar (JiGWR5-5NSP)
Measuring point	TL801
Adjustment address	27
Adjustment level	1.0 Vp-p ± 40 mVp-p



(1) Set the color bar tape for alignment (JiGWR5-5NSP).
(2) Enter the VCR adjustment mode with an adjustment remote control, and select the address 27.
Select the address, using the FF or REW key, and fix it with the PB key. (It will automatically set the playback mode.)
(3) Make an adjustment so as to get 1.0 Vp-p between SYNC TIP and WHITE PEAK on TL801.
Select the data, using the FF or REW key, and fix it with the PB key.
After the adjustment, press the STOP key, and exit from the adjustment address 27.

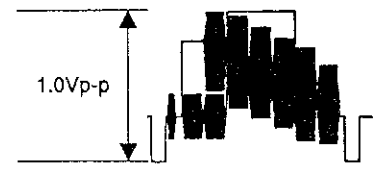
4. Adjustment of Y-FM carrier f0

Measuring instrument	Frequency counter
Mode	VCR STOP
Input signal	No input
Measuring point	TL7401
Adjustment address	33
Adjustment level	4.20 ± 0.02 MHz

(1) Input the no-signal into the video input/output terminal in the VCR STOP mode.
At this time, do not pull out the jack on the Viewcam side.
(2) Enter the VCR adjustment mode with an adjustment remote control, and select the address 33.
Select the address, using the FF or REW key, and fix it with the PB key.
(3) Make an adjustment so that the frequency counter indicates 4.2 MHz on TL7401.
Select the data, using the FF or REW key, and fix it with the PB key.
After the adjustment, press the STOP key, and exit from the adjustment address 33.

5. Adjustment of Y-FM deviation

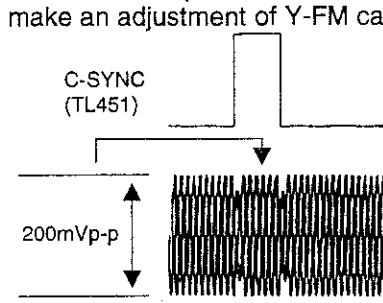
Measuring instrument	Oscilloscope
Mode	REC/PB (self-playback/recording)
Input signal	Color bar
Measuring point	TL801
Adjustment address	34
Adjustment level	1.0 Vp-p ± 40 mVp-p



(1) Set the recordable tape.
(2) Before entering the adjustment mode, make self-playback/recording of color bar with an external output.
Measure whether the playback output at this time is 1.0 Vp-p on TL801.
(3) Enter the VCR adjustment mode with an adjustment remote control, and select the address 34.
Select the address, using the FF or REW key, and fix it with the PB key.
(4) When decreasing by 10 mVp-p as compared to the measurement value of (2), increase the data of address 34 by about 5 (digit). (Reference)
When increasing by 10 mVp-p as compared to the measurement value of (2), decrease the data of address 34 by about 5 (digit). (Reference)
Select the address, using the FF or REW key, and fix it with the PB key.
(5) Release the adjustment mode, and make self-playback/recording again. When the measuring value at this time is in the standard value, the adjustment is completed. If it is not in the standard value, repeat the steps (2) - (4).
(6) After completing the adjustment of (5), check the adjusting value of Y-FM carrier f0 (4.2 MHz in no input).
When the measuring value exceeds the standard value of carrier f0, make an adjustment of Y-FM carrier f0 again.

6. Adjustment of Y recording current

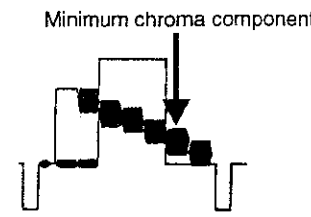
Measuring instrument	Oscilloscope
Mode	VCR STOP
Input signal	Color bar
Measuring point	TL7401
Adjustment address	35
Adjustment level	200 ± 10 mVp-p



(1) Input the color bar signal into the video input/output terminal in the VCR STOP mode.
(2) Enter the VCR adjustment mode with an adjustment remote control, and select the address 35.
Select the address, using the FF or REW key, and fix it with the PB key.
(3) Make an adjustment so that the SYNC TIP portion gets 200 mVp-p on TL7401.
Select the data, using the FF or REW key, and fix it with the PB key.
After the adjustment, press the STOP key, and exit from the adjustment address 35.

7. Adjustment of comb filter

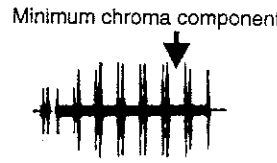
Measuring instrument	Oscilloscope
Mode	VCR STOP
Input signal	Color bar
Measuring point	TL404
Adjustment address	Phase: 36, Gain: 37
Adjustment level	Minimum chroma component



(1) Input the color bar signal into the video input/output terminal in the VCR STOP mode.
(2) Enter the VCR adjustment mode with an adjustment remote control, and select the address 36.
Select the address, using the FF or REW key, and fix it with the PB key.
(3) Make an adjustment so as to minimize the chroma component on TL404.
Select the data, using the FF or REW key, and fix it with the PB key.
After the adjustment, press the STOP key, and exit from the adjustment address 36.
(4) Enter the VCR adjustment mode with an adjustment remote control, and select the address 37.
Select the address, using the FF or REW key, and fix it with the PB key.
(5) Make an adjustment so as to minimize the chroma component on TL401.
Select the data, using the FF or REW key, and fix it with the PB key.
After the adjustment, press the STOP key, and exit from the adjustment address 37.
(6) Repeat the steps (2) - (3).

8. Adjustment of chroma emphasis f0

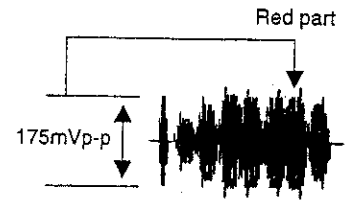
Measuring instrument	Oscilloscope
Mode	VCR STOP
Input signal	Color bar
Measuring point	TL7402
Adjustment address	38
Adjustment level	Minimum chroma component



(1) Input the color bar signal into the video input/output terminal in the VCR STOP mode.
(2) Enter the VCR adjustment mode with an adjustment remote control, and select the address 38.
Select the address, using the FF or REW key, and fix it with the PB key.
(3) Make an adjustment so as to get minimum chroma component on TL7402.
Select the data, using the FF or REW key, and fix it with the PB key.
After the adjustment, press the STOP key, and exit from the adjustment address 38.

9. Adjustment of C recording current

Measuring instrument	Oscilloscope
Mode	VCR STOP
Input signal	Color bar
Measuring point	TL7402
Adjustment address	39
Adjustment level	175 ± 10 mVp-p

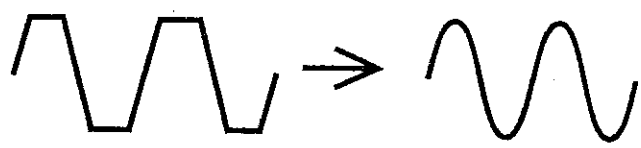


(1) Input the color bar signal into the video input/output terminal in the VCR STOP mode.
(2) Enter the VCR adjustment mode with an adjustment remote control, and select the address 39.
Select the address, using the FF or REW key, and fix it with the PB key.
(3) Make an adjustment so that the amplitude of red portion gets 175 mVp-p on TL7402.
Select the data, using the FF or REW key, and fix it with the PB key.
After the adjustment, press the STOP key, and exit from the adjustment address 39.

6-1-6. Adjustment of audio circuit

1. Adjustment of filter f0

Measuring instrument	Oscilloscope
Mode	PB
Input signal (tape)	JiGWR5-5NSP
Measuring terminal	TL605/AUDIO.OUT
Adjustment address	21
Adjustment value	Clear the waveform



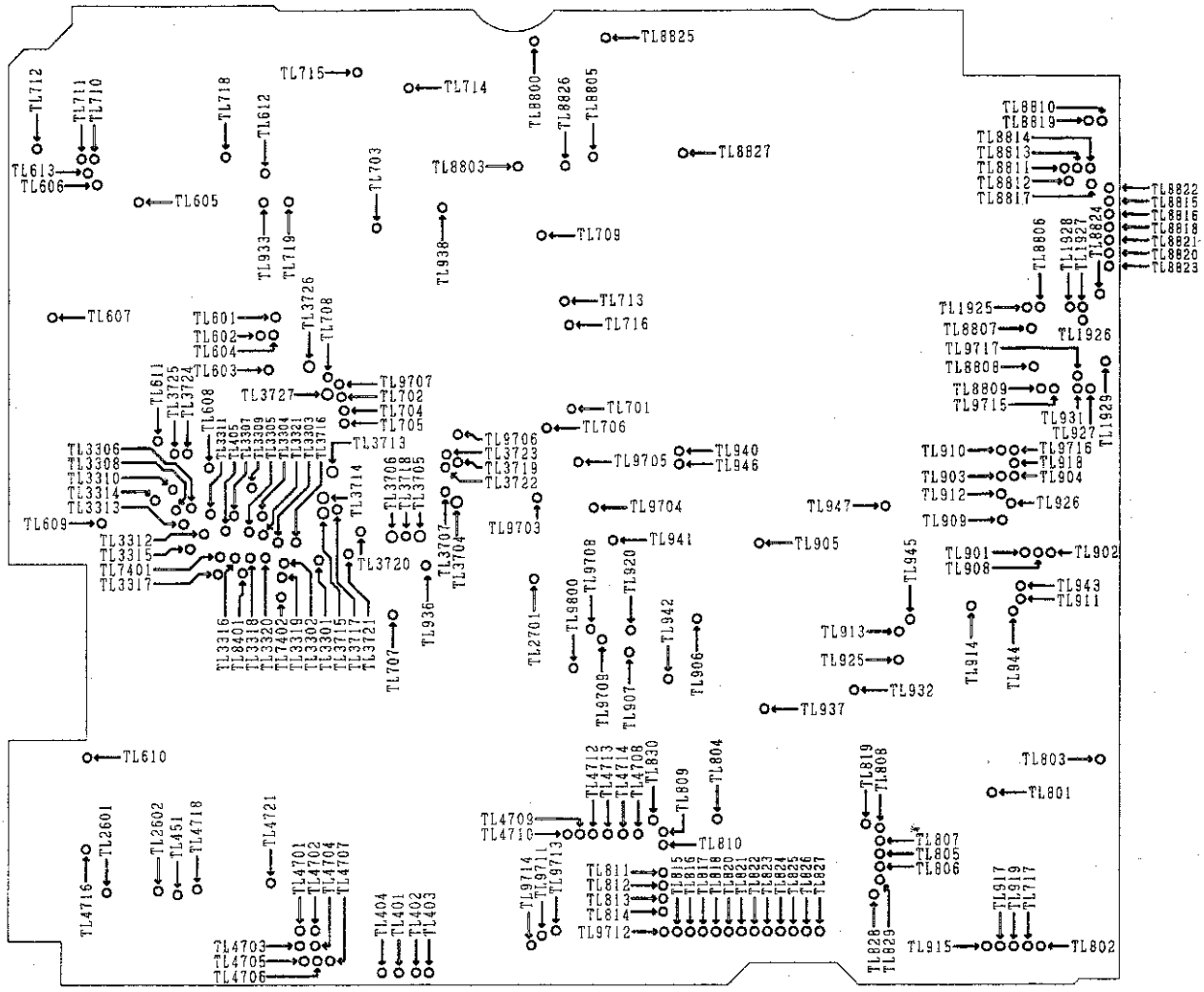
1) Set the alignment tape (JiGWR5-5NSP)
2) Using the adjustment remote controller (RRMCG0033TASA), set the VCR adjustment mode, and set the address "21" with the operation switch (FF/REWIND key).
3) Play back the standard tape.
4) Using the operation switch (FF/REWIND key), make an adjustment so that the most clear playback waveform is obtained on TL605.
5) Press the operation switch (PLAYBACK key) to write the data.
6) Press the operation switch (STOP key) to exit from the address "21".
(The address "21" blinks.)

Audio Check
Checking of self-recording/playback

Measuring instrument	Valve voltmeter (oscilloscope)
Mode	REC → PB
Input signal (tape)	400 Hz, -8 dBs (872 mVp-p)
Measuring terminal	Audio IN/OUT
Adjustment address	—
Adjustment value	-8 dBs ± 4 dBs (580 to 1370 mVp-p)

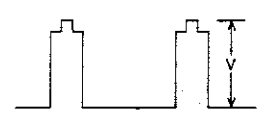
1) Input the audio signal (400Hz, -8dBs) into the Audio line IN/OUT terminal, and record.
2) Connect the valve voltmeter (oscilloscope) to the Audio line IN/OUT terminal.
3) Play back the record, and ascertain that the output waveform level is -8 dBs ± 4 dBs (580 to 1370 mVp-p on the oscilloscope).
4) If there is any deviation from the specified value, perform adjustment again as stated in items 1) above, and check again the self-recording/playback level.

6-1-7. Adjustment of LCD display circuit

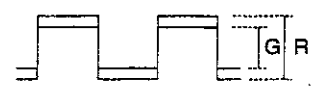


Adjustment procedures and connections are the same as with the VCR section.

1. Contrast adjustment

Measuring point	TL817 (G-OUT)
Address	40
Mode	VCR AV input
Adjusting method	1) Set the data of address 47 at the address 80. 2) Input white 100% as an AV input. 3) Connect TL805 to GND. (The 1H inversion stops.) 4) Connect 220 KΩ between TL803 and GND. 5) Seeing the waveform of TL817 (G-OUT), make an adjustment between the white peak and the sync tip. 
Adjustment standard	3.35V ± 0.1V
Remarks	———

2. R-W/B adjustment

Measuring point	TL817 (G-OUT) TL816 (R-OUT)
Address	41
Mode	VCR AV input
Adjusting method	1) AV input: Nonsignal. 2) TL817 (G-OUT): Oscilloscope CH1 TL816 (R-OUT): Oscilloscope CH2 3) Adjust P-P of TL816 becomes bigger 0.15V than TL817. 
Adjustment standard	±0.1Vp-p
Remarks	———

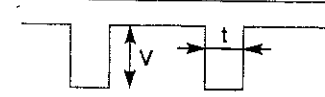
3. B-W/B adjustment

Measuring point	TL817 (G-OUT) TL818(B-OUT)
Address	42
Mode	VCR AV input
Adjusting method	1) AV input: Nonsignal. 2) TL817 (G-OUT): Oscilloscope CH1 3) TL818 (B-OUT): Oscilloscope CH2 4) Adjust P-P of TL818 become bigger 0.1V than TL817.
Adjustment standard	±0.1Vp-p
Remarks	————

4. VCO adjustment

Measuring point	TL808
Address	43
Mode	VCR AV input
Adjusting method	1) AV input : NON Signal 2) Connect the frequency counter to TL808, and adjust the frequency.
Adjustment standard	15.734kHz ± 100Hz
Remarks	————

5. H-position adjustment

Measuring point	TL808
Address	44
Mode	VCR AV input
Adjusting method	1) Input the white 100% signal as an AV input. 2) Connect the oscilloscope to TL808, and adjust the pulse width. 
Adjustment standard	3.4µsec ± 0.15µsec
Remarks	————

6. COMMON PULSE adjustment

Measuring point	TL821
Address	22
Mode	VCR AV input
Adjusting method	1) Set the data of address 47 at the address 80. 2) Input the white 100% signal as an AV input. 3) Connect the oscilloscope to TL821, and adjust the pulse width.
Adjustment standard	6.6Vp-p ± 0.1Vp-p
Remarks	————

7. COM-BIAS adjustment

Measuring point	LCD panel display surface
Address	45
Mode	VCR AV input
Adjusting method	1) Input the white 40% signal as an AV input, and set data of address 47 at the address 80. 2) Set the illuminometer (TOPCON IM-3) on the LCD panel surface (do not allow entry of external light). 3) Connect the illuminometer to the oscilloscope. 4) Make an adjustment so as to minimize the ripple of output waveform. Response time: 0.6 sec 5) Adjust again if longitudinal stripe appears evidently. * Or set to the point where the black is settled deepest with the grey scale signal.
Adjustment standard	Minimum
Remarks	Make an adjustment after aging for 5 minutes or more.

8. W/B adjustment

Measuring point	LCD panel display surface
Address	41, 42
Mode	VCR AV input
Adjusting method	1) White fade signal input. 2) Adjust so as to get the same white screen as that of standard monitor. (Adjust again, visually checking as stated in item 2.3.)
Adjustment standard	Standard monitor
Remarks	Make an adjustment after aging for 5 minutes or more.

9. Inverter input voltage setting

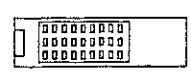
Measuring point	LCD panel display surface
Address	11, 12
Mode	VCR AV input
Adjusting method	Set the data of addresses 11 and 12.
Adjustment standard	11=C1
	12=9A
Remarks	————

6-2. ADJUSTMENT OF CAMERA SECTION

6-2-1. Servicing of camera section

(1) Object, measuring instrument and jigs necessary for camera section servicing

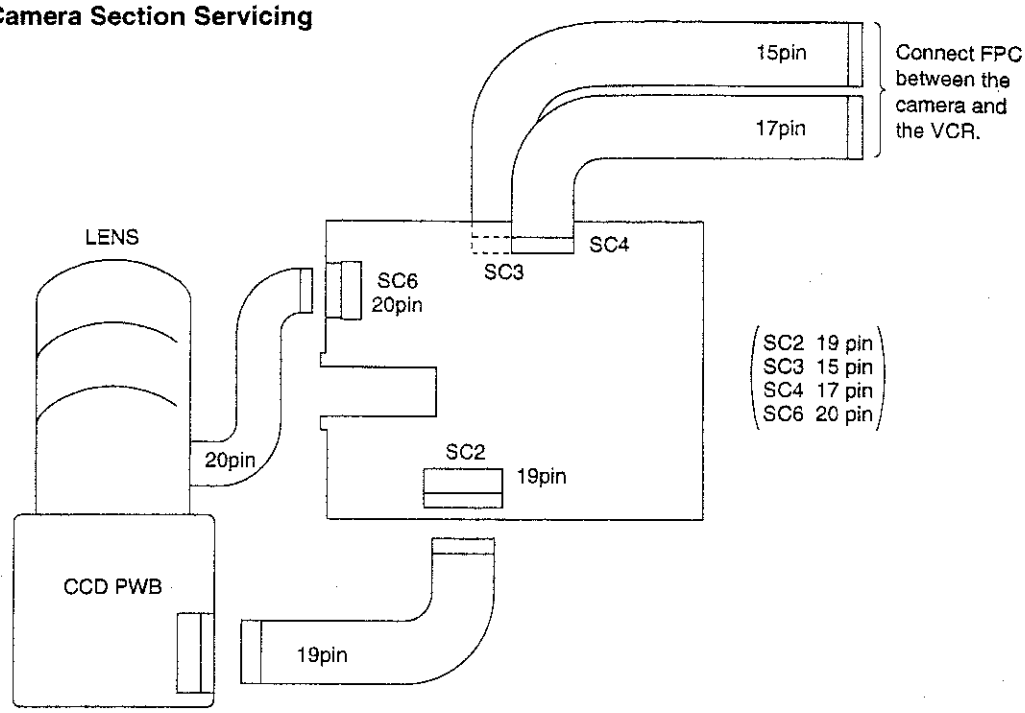
- Gray scale chart
- Color bar chart
- AC adapter
- Vectorscope
- Color temperature conversion filter HOYA "LB-165"
- Extension cable
- Digital voltmeter
- Service Remote Control
- Oscilloscope
- Halogen light (2 pcs.)
- Video output cable
- Color video monitor

NO.	Item	Part Cord	Price Code	Configuration	Note
1	Gray Scale Chart (390 x 520 mm)	JiGCHART-1	CP		
2	Color Bar Chart (240 x 320 mm)	JiGCHART-4	DA		
3	Color Temperature Conversion Filter	JiGHOYA-LB165	BN		
4	Service Remote Control	RRMCG0033TASA	BT		

Note:

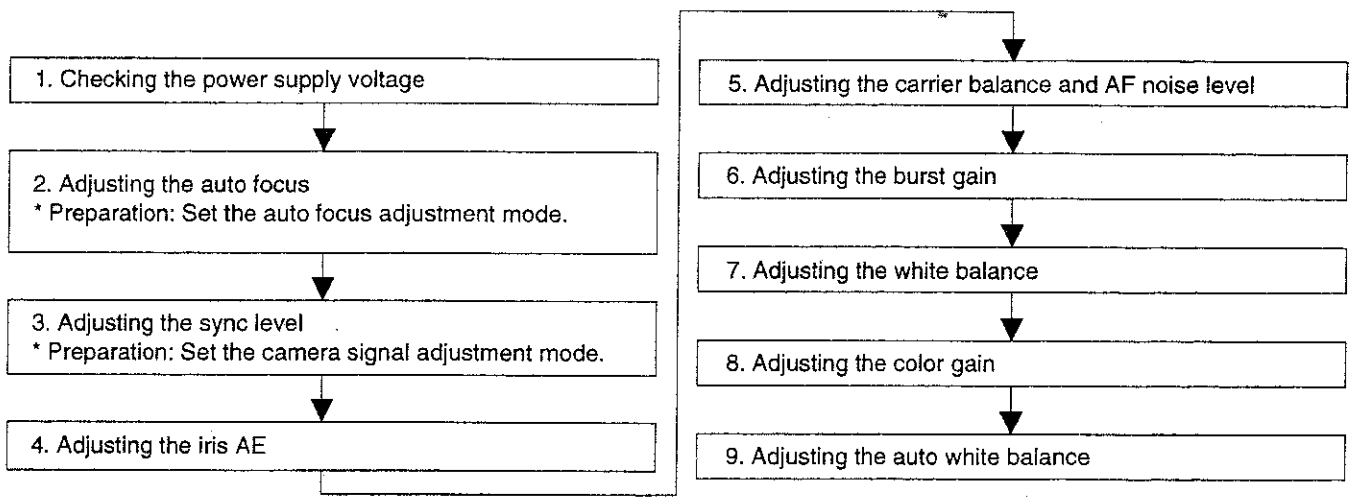
1. Color temperature conversion filter (jig item No.3) may be obtained from HOYA Optics in your local market.
2. N: Indicates the new jigs.

• **Connections for Camera Section Servicing**



6-2-2. Adjustment procedures

This adjusting procedure covers all the steps for conducting the adjustments all the way. There are some steps that may be skipped, depending on the specific needs for servicing and adjustment.


1. Checking the power supply voltage
2. Adjusting the auto focus
* Preparation: Set the auto focus adjustment mode.
3. Adjusting the sync level
* Preparation: Set the camera signal adjustment mode.
4. Adjusting the iris AE
5. Adjusting the carrier balance and AF noise level
6. Adjusting the burst gain
7. Adjusting the white balance
8. Adjusting the color gain
9. Adjusting the auto white balance

6-2-2-1. Checking the power supply voltage

- Measuring terminal: CAM 4.9V
  CAM 2.9V
  CAM 15V
  CAM -8V
  LENS 5V
- Measuring instrument: Digital voltmeter

6-2-2-2. Auto focus adjustment

• Basic iris adjustment

Measuring instrument	None
Subject	—
Tape	—
Test point	None
Adjustment address	1FE
Adjustment level	09, 0A, 0B

1) Set up the auto focus adjustment mode. (Write 01 to the address 1FE)
2) Write the adjustment data 09, 0A and 0B one after the other to the address 1FF, the adjustment are as follows.

Data	Adjustment
09	Hall offset
0A	Iris offset
0B	Iris close

• Lens adjustment

Measuring instrument	None
Subject	More than 50 m away
Tape	—
Test point	None
Adjustment address	1FF
Adjustment level	11, 12, 06, 08

1) Set up the auto focus adjustment mode.
   (This is unnecessary after the above basic iris adjustment has been made.)
2) Write the adjustment data 11, 12, 06 and 08 one after the other to the address 1FF. The adjustments are as follows.
3) Write FF to the address 1FE to exit the auto focus adjustment mode.

Data	Adjustment
11	Voltage adjustment
12	Optical wide-end adjustment
06	Wide-end focus ∞ position adjustment
08	Tele-end focus ∞ position adjustment

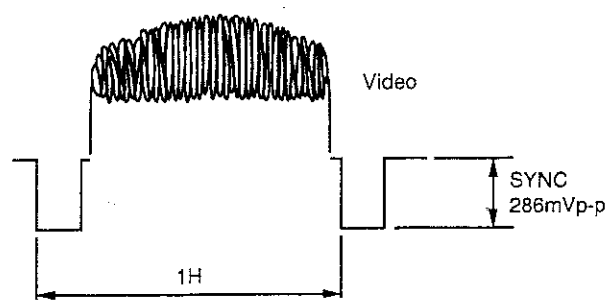
6-2-2-3.

Before starting these adjustments, set up the auto focus adjust.

• Sync level adjustment

Measuring instrument	Oscilloscope
Subject	Anything
Tape	—
Test point	VIDEO OUT (Terminated in 75Ω)
Adjustment address	1FE
Adjustment level	286mVp-p

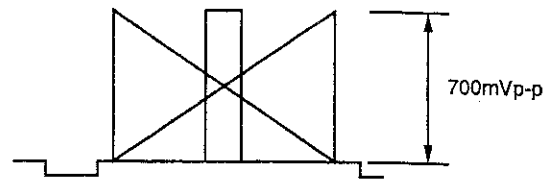
1) Set up the camera signal adjustment mode. (Write 00 to the address 1FE)
2) Connect the oscilloscope to the VIDEO-OUT. Adjust the sync level to 286mVp-p.



6-2-2-4.

• Iris AE adjustment

Measuring instrument	Oscilloscope
Subject	Gray scale
Tape	—
Test point	VIDEO-OUT
Adjustment address	1FD
Adjustment level	700mVp-p



1) Shoot the gray scale in the standard way. Observe the VIDEO-OUT signal on the oscilloscope screen and rewrite the data of address 1FD to get an amplitude of 700mVp-p as shown above.

6-2-2-5.

• Carrier balance , AF noise level adjustment

Measuring instrument	None
Subject	Anything
Tape	—
Test point	None
Adjustment address	1FF
Adjustment level	01

1) Preparation : write FF to address 19C, 19D, 19E, 19F, 1A0, 1A1.
2) Write the data 01 to the address 1FF.
   The following adjustments are automatically carried on ; ① Carrier balance adjustment
   ② AF noise level adjustment
   at AGC Gain Min , AGC Gain Max and Gain up.

6-2-2-6.

• Burst gain adjustment

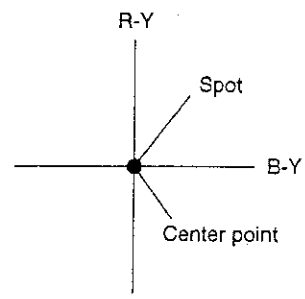
Measuring instrument	Oscilloscope
Subject	None
Tape	—
Test point	VIDEO OUT (Terminated in 75 Ω)
Adjustment address	1F9
Adjustment level	286mVp-p

1) Measure the burst signal level on the oscilloscope. Using the address 1F9, adjust the burst amplitude to 286mVp-p.

6-2-2-7.

• White balance adjustment

Measuring instrument	Vector scope
Subject	Gray scale
Tape	—
Test point	VIDEO OUT (Terminated in 75 Ω)
Adjustment address	R-GAIN 010, B-GAIN 012
Adjustment level	R-Gain 0 % ± 3 % B-Gain 0 % ± 3 %

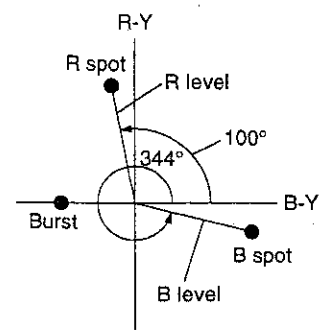


1) Adjust the spot to the center of vector scope (R-Y : 0%, B-Y : 0%) using address 010 and 012.

6-2-2-8.

• Color gain adjustment

Measuring instrument	Vector scope
Subject	Color bar chart
Tape	—
Test point	VIDEO OUT (Terminated in 75 Ω)
Adjustment address	R-Y GAIN 0DD B-Y GAIN 0DB R-Y MAT 0D7 B-Y MAT 0D9
Adjustment level	R-Y GAIN; Burst ratio 1.2 ± 0.1 B-Y GAIN; Burst ratio 1.0 ± 0.1 R-Y MAT; 100 ± 2° B-Y MAT; 344 ± 2°

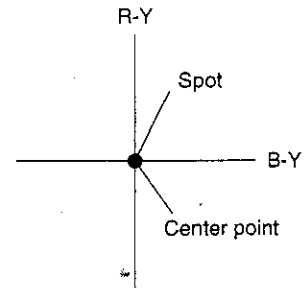


1) Using the address 0DD, adjust the R level to a burst ratio of 1.2. With the address 0DB, adjust the B level to a burst ratio of 1.0.
2) Using the address 0D7, adjust the R phase to 100°. With the address 0D9, adjust the B phase to 344°.
3) Repeat the above steps 1) and 2).

6-2-2-9.

• Auto white balance adjustment

Measuring instrument	Vector scope
Subject	Gray scale
Tape	—
Test point	VIDEO OUT (Terminated in 75 Ω)
Adjustment address	R-OUT DOOR 016 B-OUT DOOR 018
Adjustment level	R-OUT DOOR; 0 ± 3 % B-OUT DOOR; 0 ± 3 %

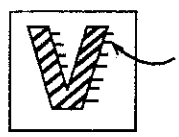


1) Attach the color temperature conversion filter (JIGHOYA-LB165) to the front of the lens.
2) Using the addresses R-OUT DOOR 016 and B-OUT DOOR 018, adjust the spot to the center.
3) Take off the color temperature conversion filter.
4) Write FF to the address 1FE to exit camera signal adjustment mode.

6-3. TROUBLE SHOOTING

6-3-1. Classification of troubles

No function at all	YES	Check the Power circuit and system control circuit.
No tape ejection	YES	Check the system control and loading motor circuit.
No LCD light-up	YES	Check the inverter transformer and power circuit.
No picture in EE mode	YES	* Check the camera section and Y/C circuit and LCD circuit.
No picture playback	YES	Check the Y/C circuit and head amplifier circuit.
No video recording	YES	Check the Y/C circuit and head amplifier circuit.
Streaking at self-recording/playback	YES	Check the Y/C circuit and head amplifier circuit.



Noises at regular intervals in playback	YES	Check the ATF circuit.
No recorded characters on screen	YES	Check the LCD circuit and character generator (IC705).
No color in EE mode	YES	* Check the camera section and Y/C circuit.
No color in playback	YES	Check the Y/C circuit and head amplifier circuit.
No color in recording	YES	Check the Y/C circuit and head amplifier circuit.
No sound	YES	Check the audio circuit.
Error message (e.g. E007)	YES	Check the system controller and CAP MOTOR DRIVER circuit.

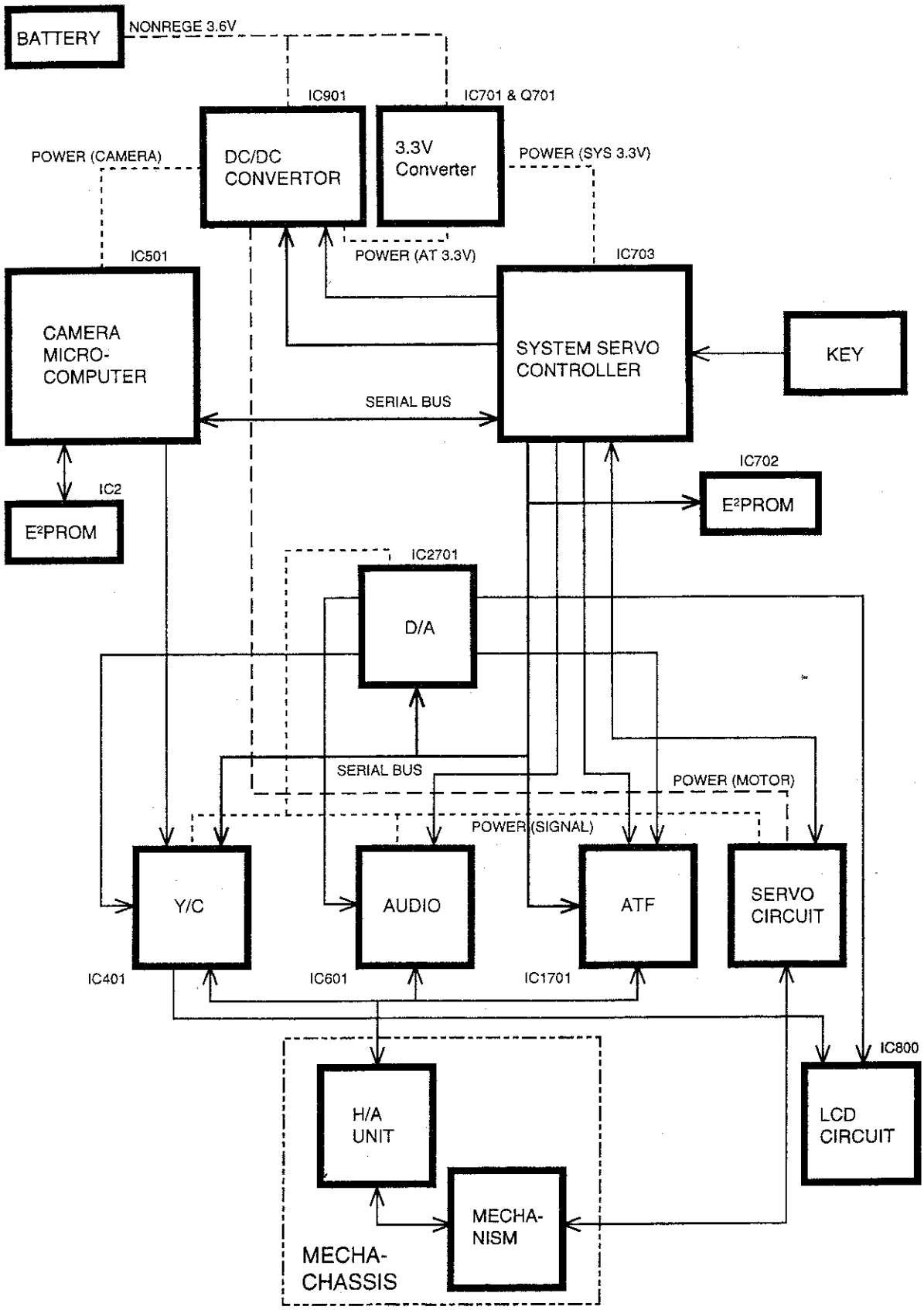
Normal

6-3-2. Troubleshooting for the camera section

No picture	YES	Check the lens drive circuit (IC551) and main signal line.
No color	YES	Check IC201 (DSP), and their peripherals.
No auto white balance function	YES	Check IC501 (camera CPU) and its peripherals.
No auto focus function	YES	Check IC501, IC551 and their peripherals.
No power zoom function	YES	Check IC501, IC551 and their peripherals.

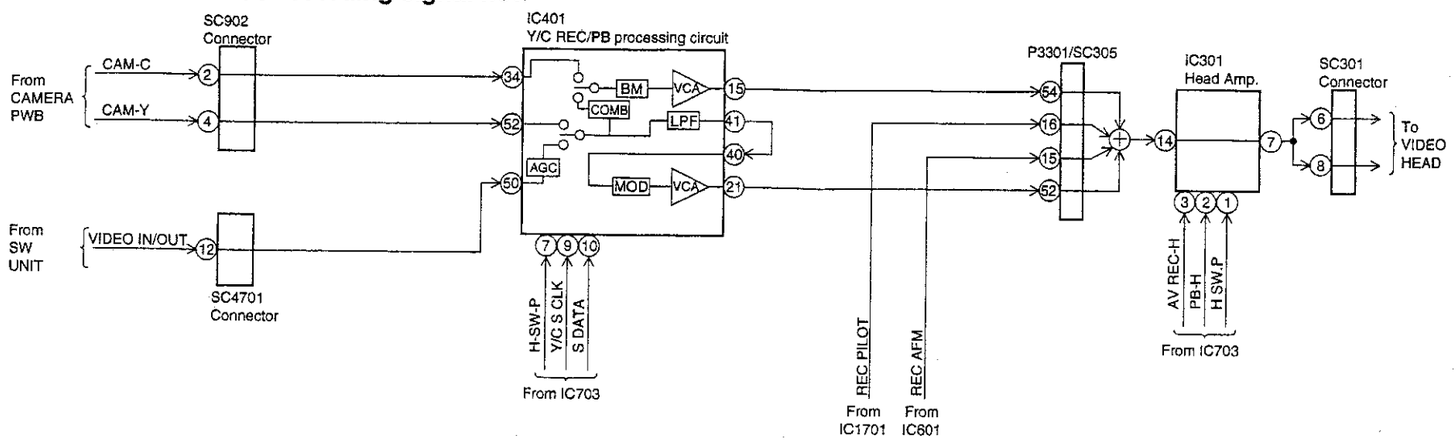
Normal

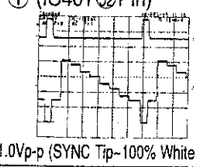
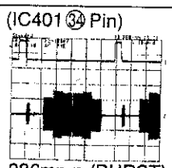
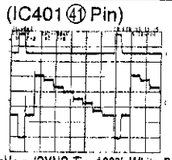
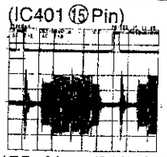
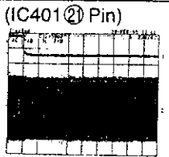
7. SYSTEM BLOCK DIAGRAM

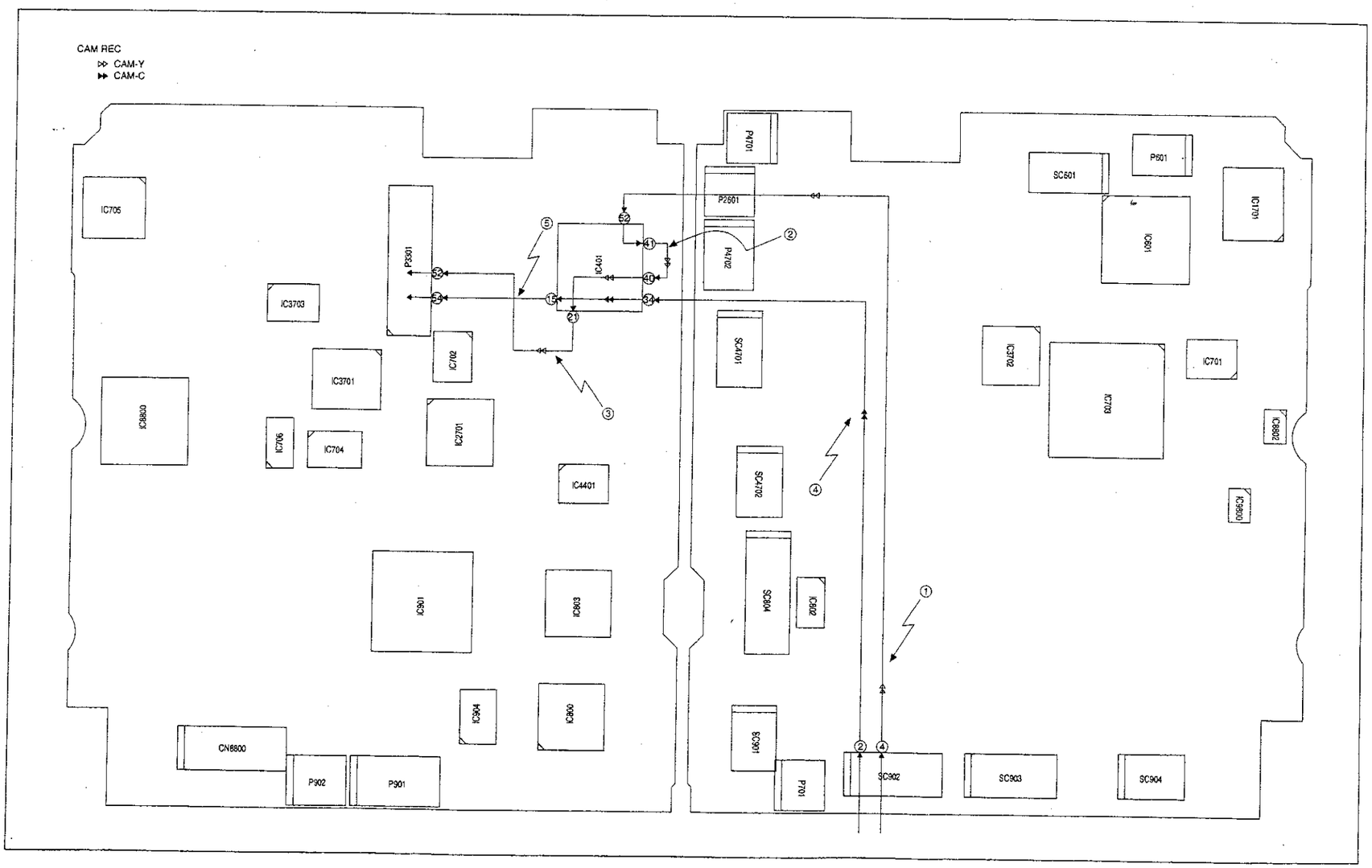


* On this model, all the circuits of the VCR and camera sections are controlled by IC703 and IC501.
  1) IC501 and IC401 are controlled with the serial data from IC703.
  2) IC702 is a memory that serves to store the adjustment data of the VCR section.
  3) IC2 is a memory that serves to store the adjustment data of the camera section.
  4) The other circuits and ICs are under the L/H level or the PWM control.

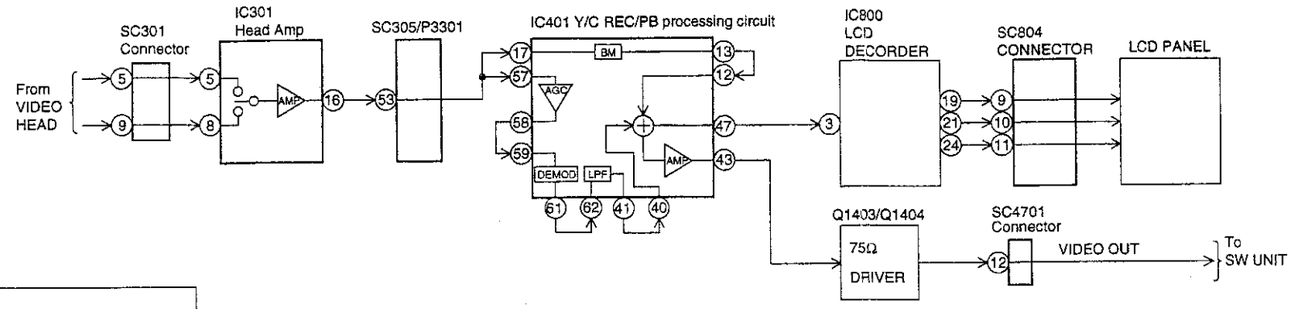
7-1. VCR SECTION BLOCK DIAGRAM Y/C recording signal flow



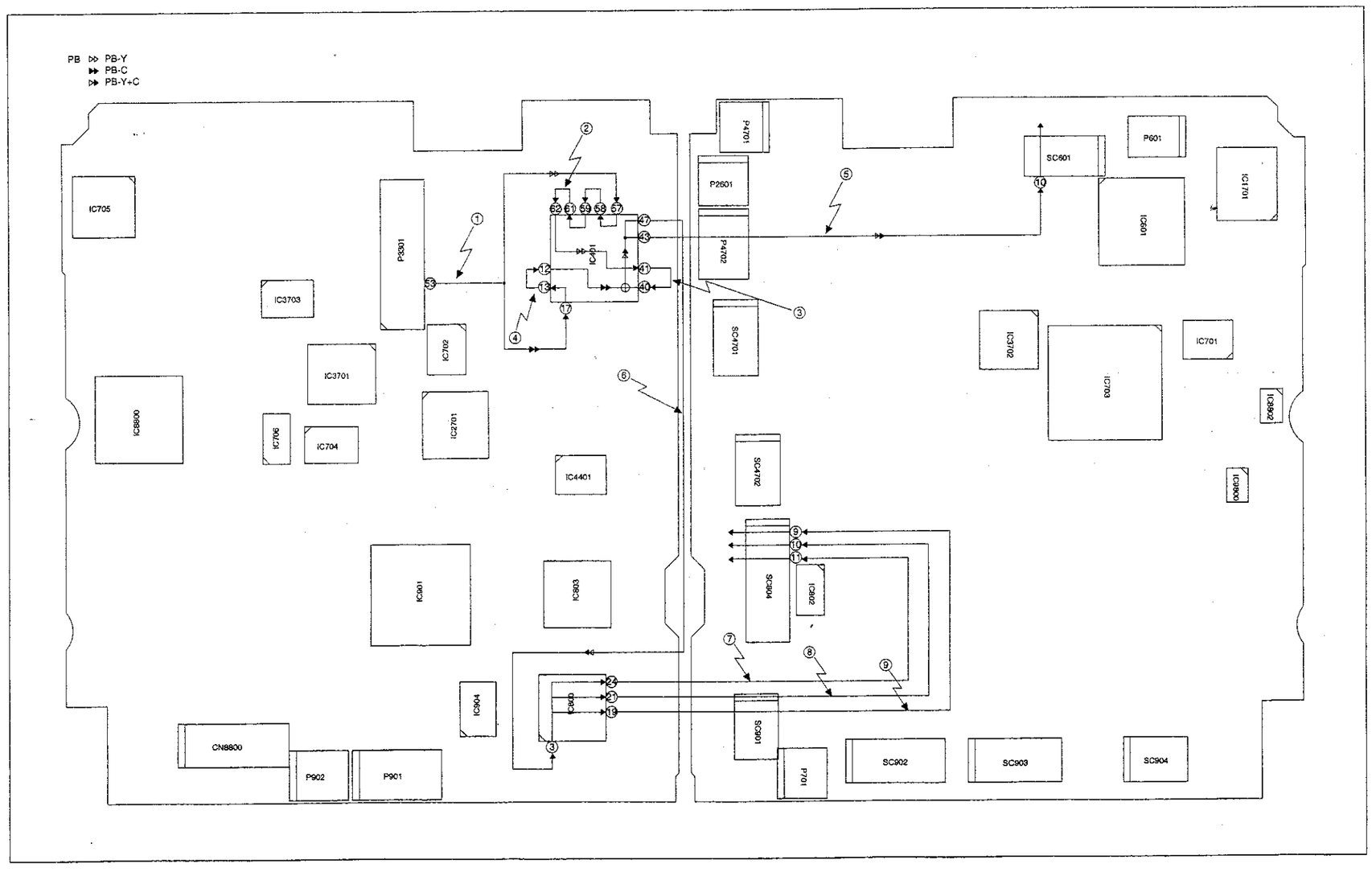
Signal waveform	Signal waveform
① (IC401 ㊷ Pin)  1.0Vp-p (SYNC Tip~100% White Peak)	④ (IC401 ㉞ Pin)  286mp-p (BURST)
② (IC401 ㊶ Pin)  500mVp-p (SYNC Tip~100% White Peak)	⑤ (IC401 ⑮ Pin)  175mVp-p (BURST)
③ (IC401 ㉑ Pin)  200mVp-p	



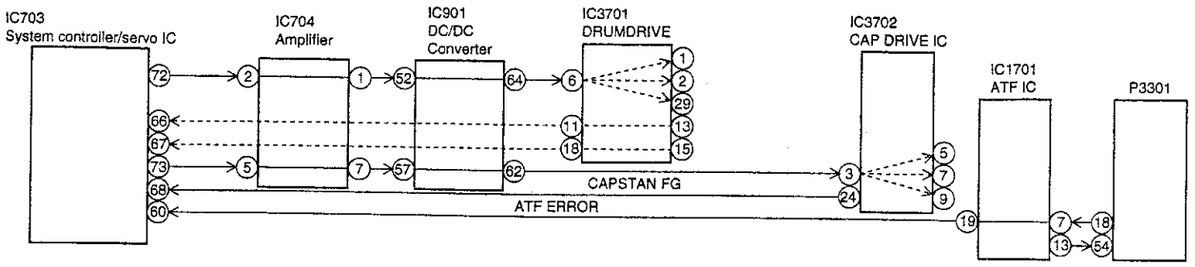
7-2. VCR SECTION BLOCK DIAGRAM Y/C playback signal flow



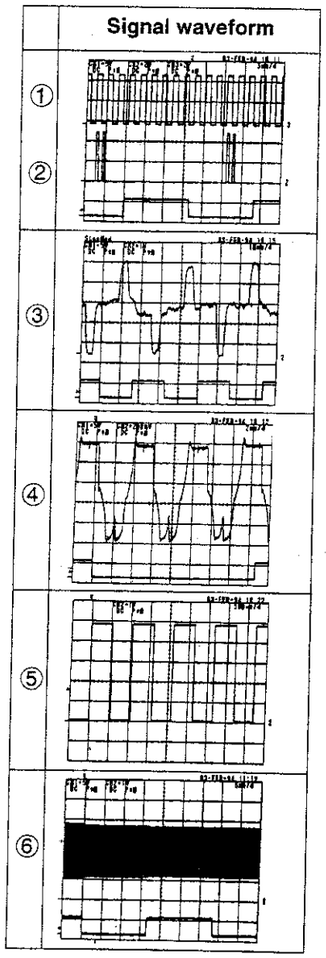
Signal waveform	Signal waveform
① (P3301 ⑤③ Pin)	⑥ (IC401 ④⑦ Pin)
	1.0Vp-p (SYNC Tip~100% white peak)
② (IC401 ⑥② Pin)	⑦ (IC800 ②④ Pin)
	3.6Vp-p
③ (IC401 ④⓪ Pin)	⑧ (IC800 ②① Pin)
	3.6Vp-p
④ (IC401 ①③ Pin)	⑨ (IC800 ①⑨ Pin)
	3.6Vp-p
⑤ (IC401 ④③ Pin)	
2.0Vp-p (SYNC Tip~100% white peak)	

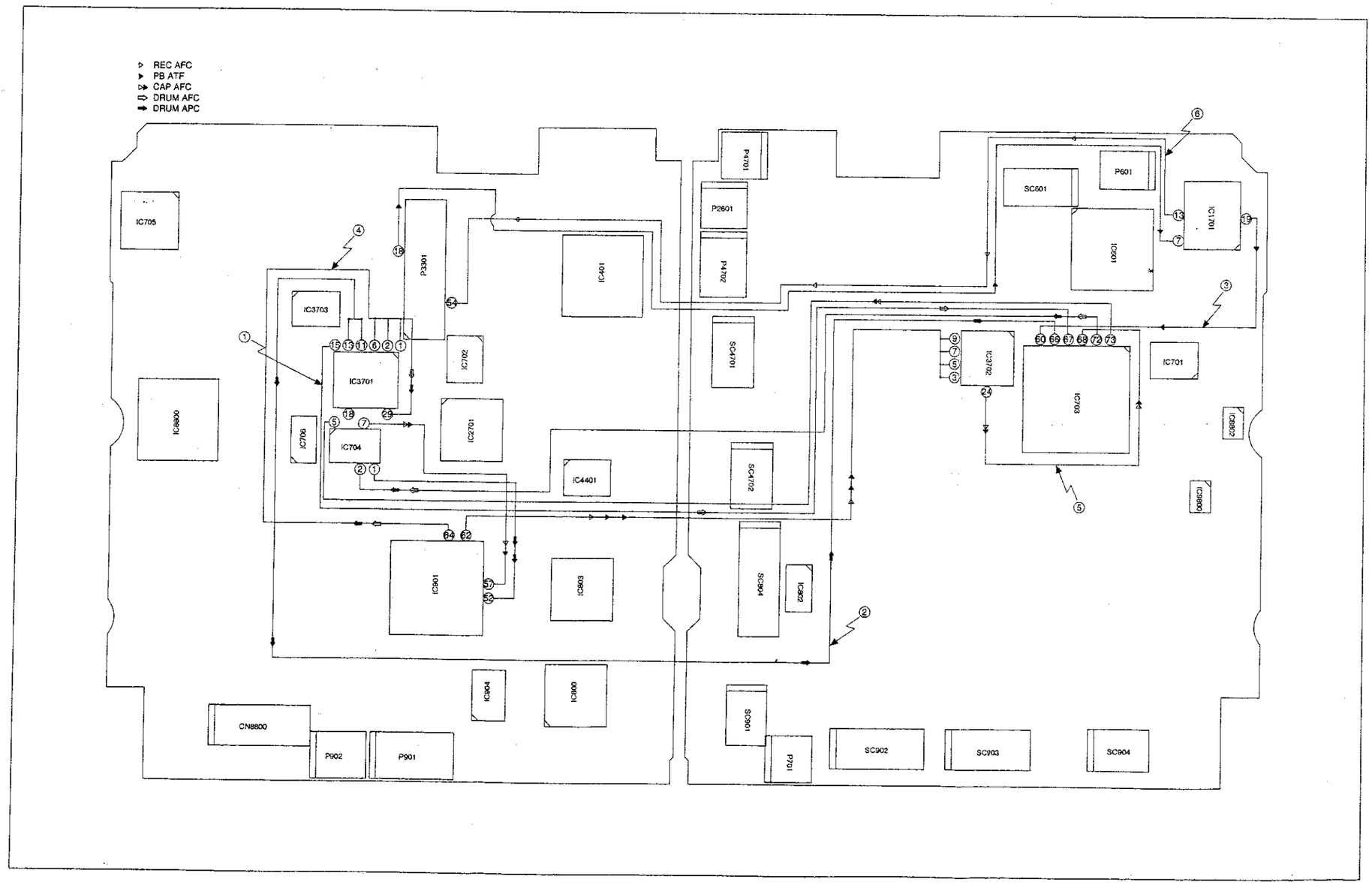


7-3. VCR SECTION BLOCK DIAGRAM Drum/capstan servo system signal flow

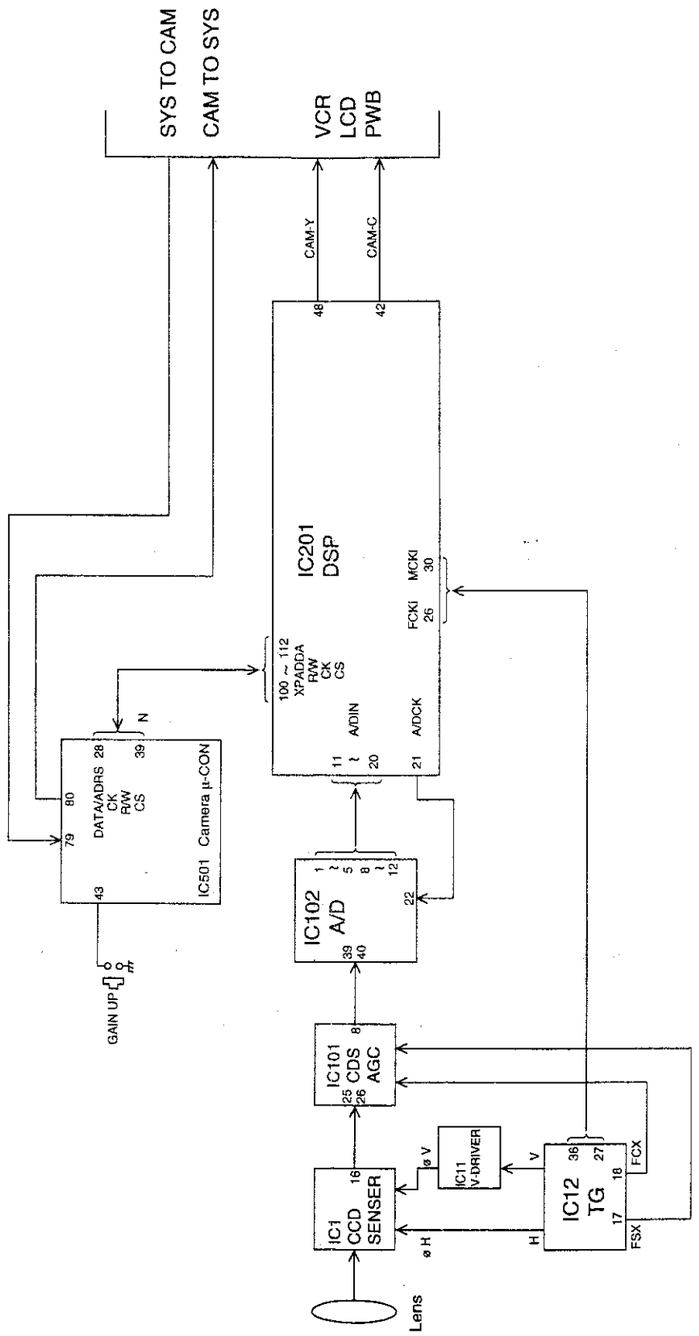


Signal waveform



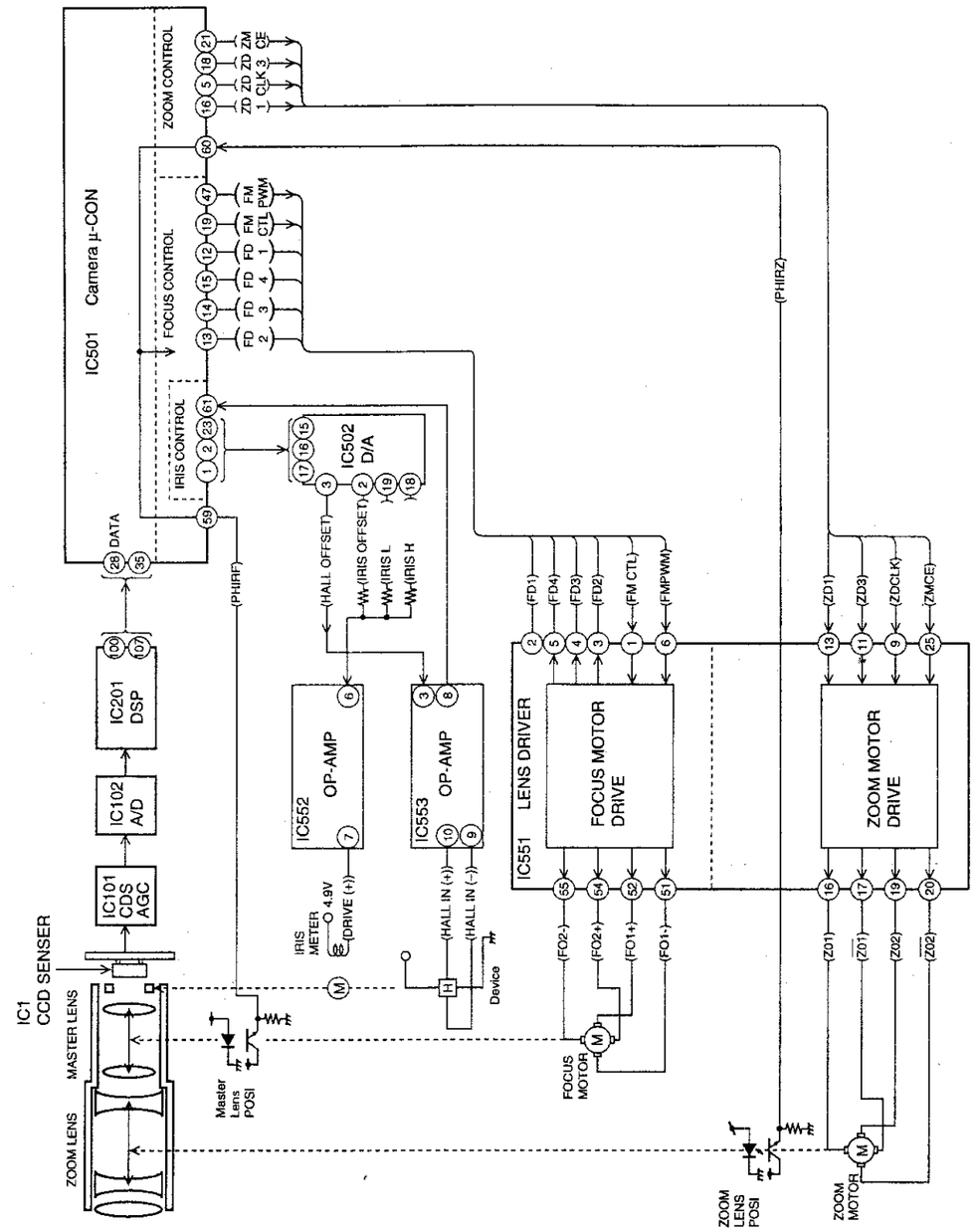


7-4. CAMERA SECTION BLOCK DIAGRAM



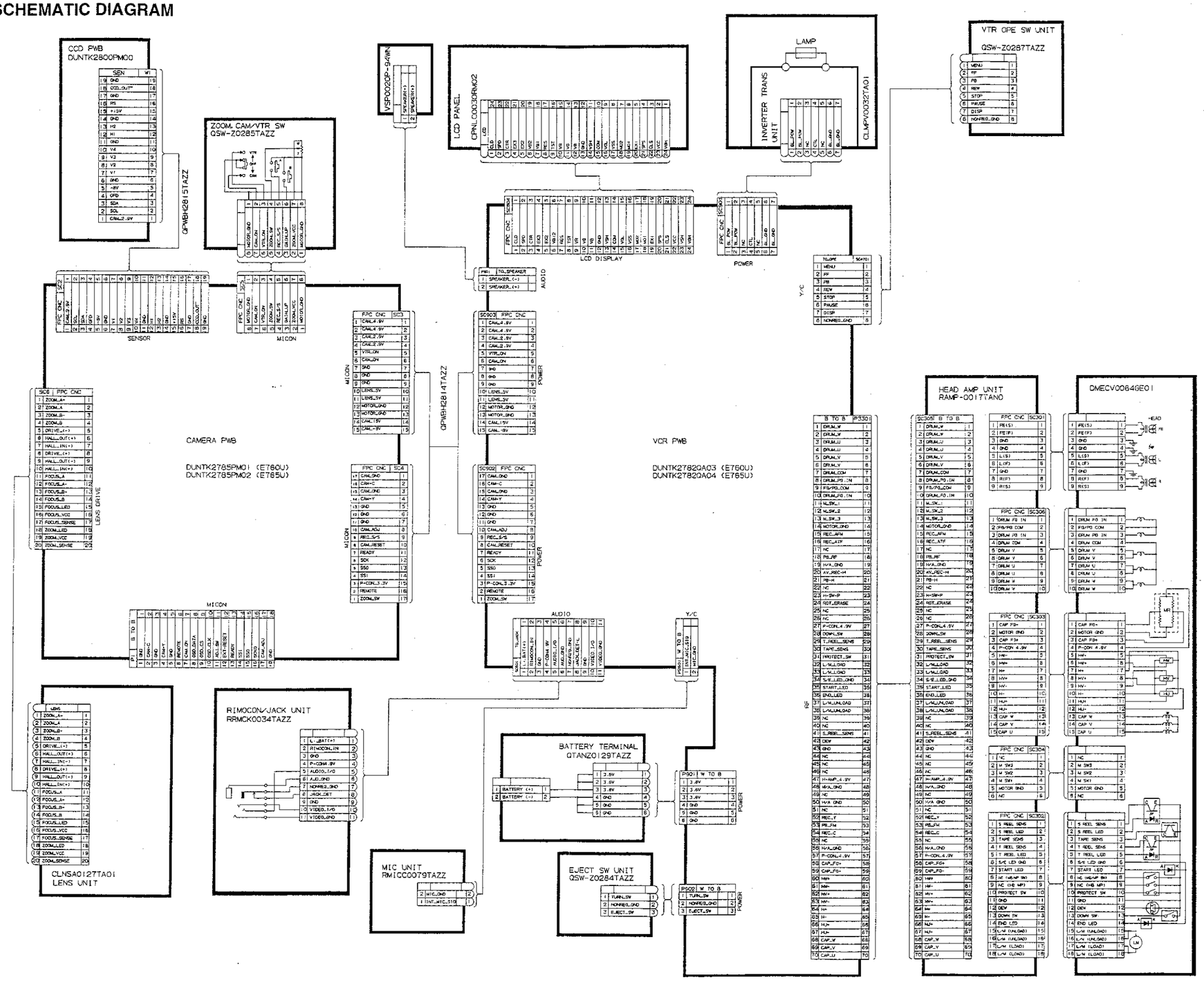
VL-E760U
VL-E765U

7-5. LENS DRIVE BLOCK DIAGRAM



8. SCHEMATIC DIAGRAMS

8-1. OVERALL SCHEMATIC DIAGRAM

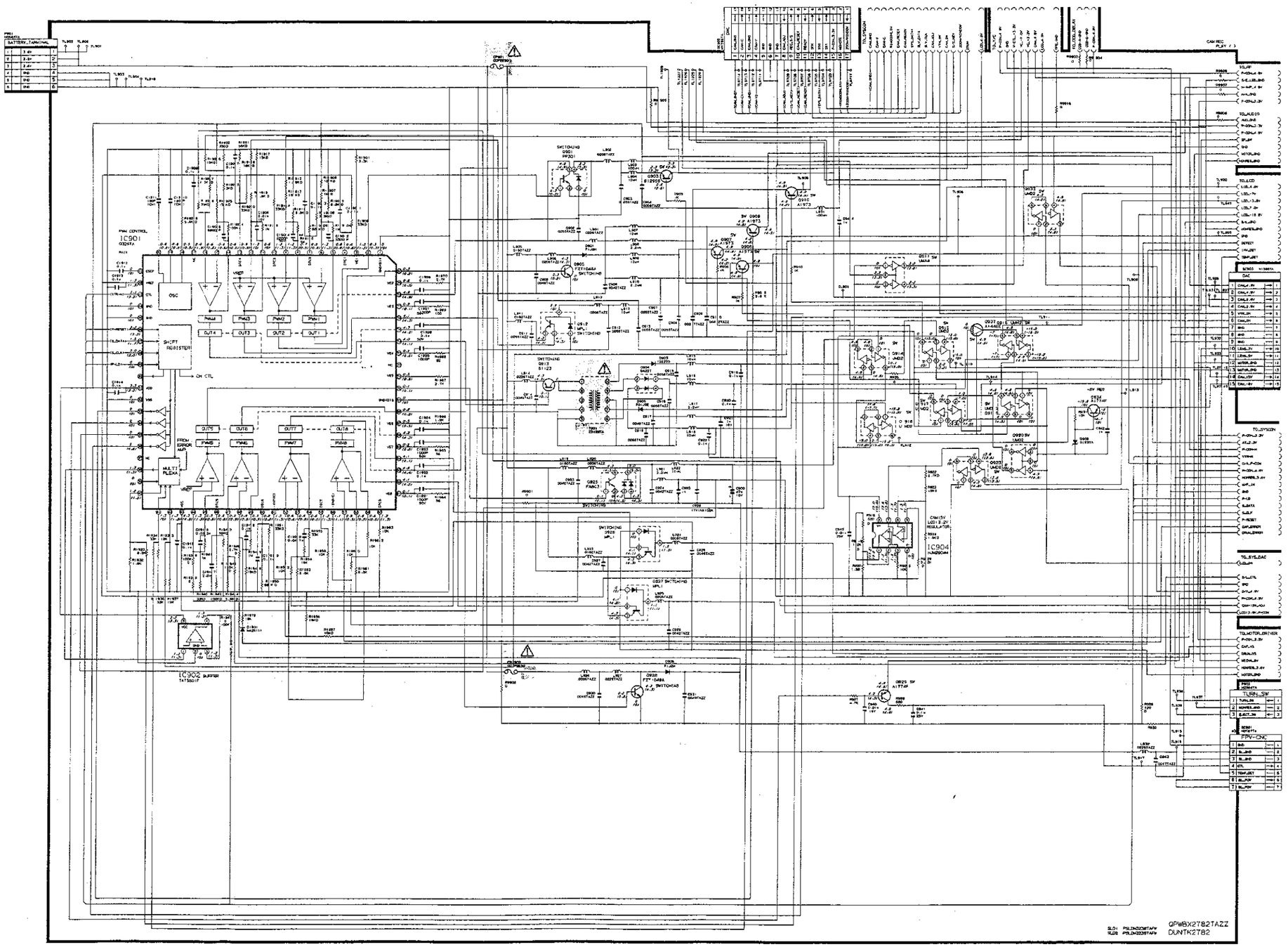


8-1

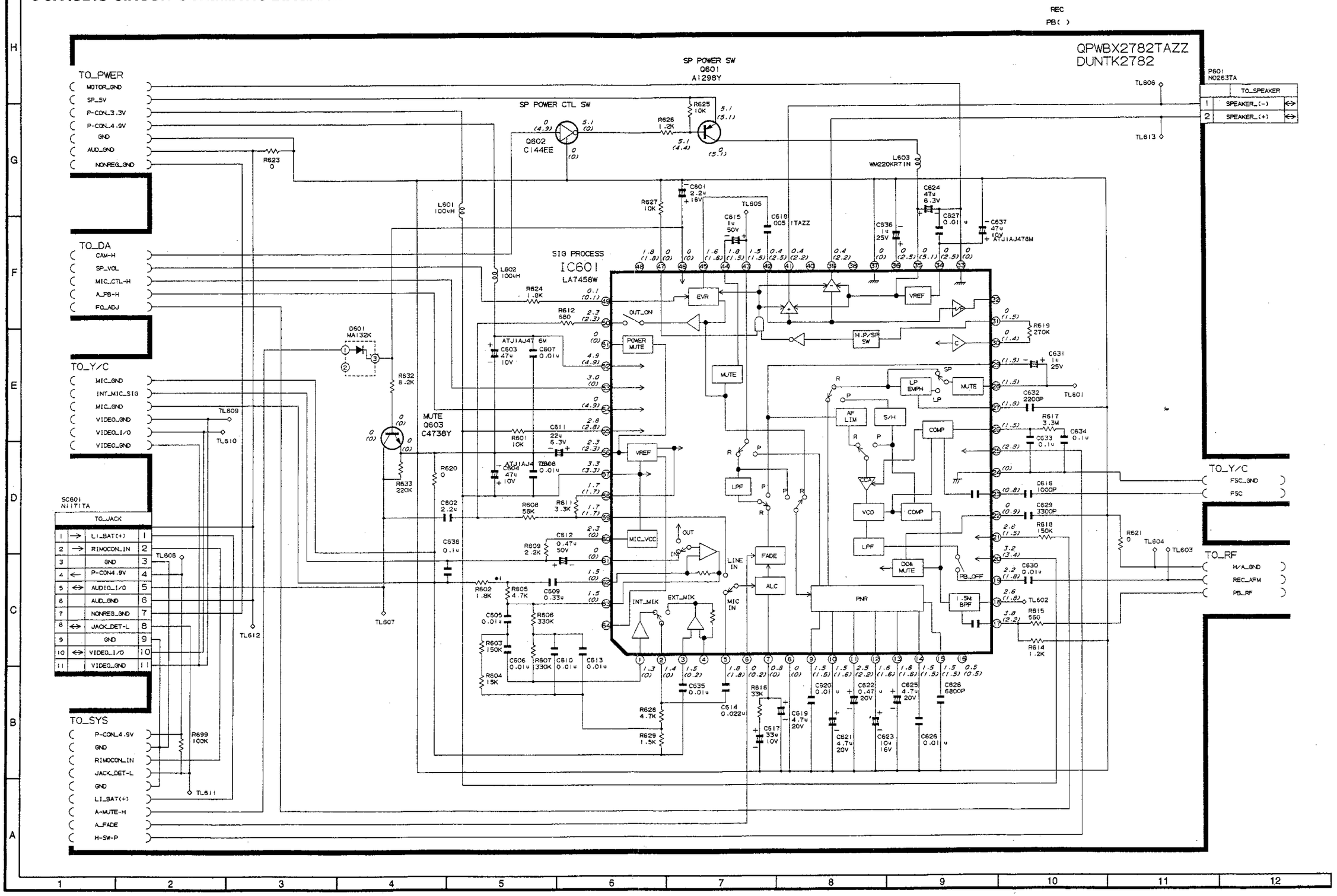
8-2

8-2. POWER CIRCUIT SCHEMATIC DIAGRAM

⚠ AND SHADED COMPONENTS=SAFETY RELATED PARTS

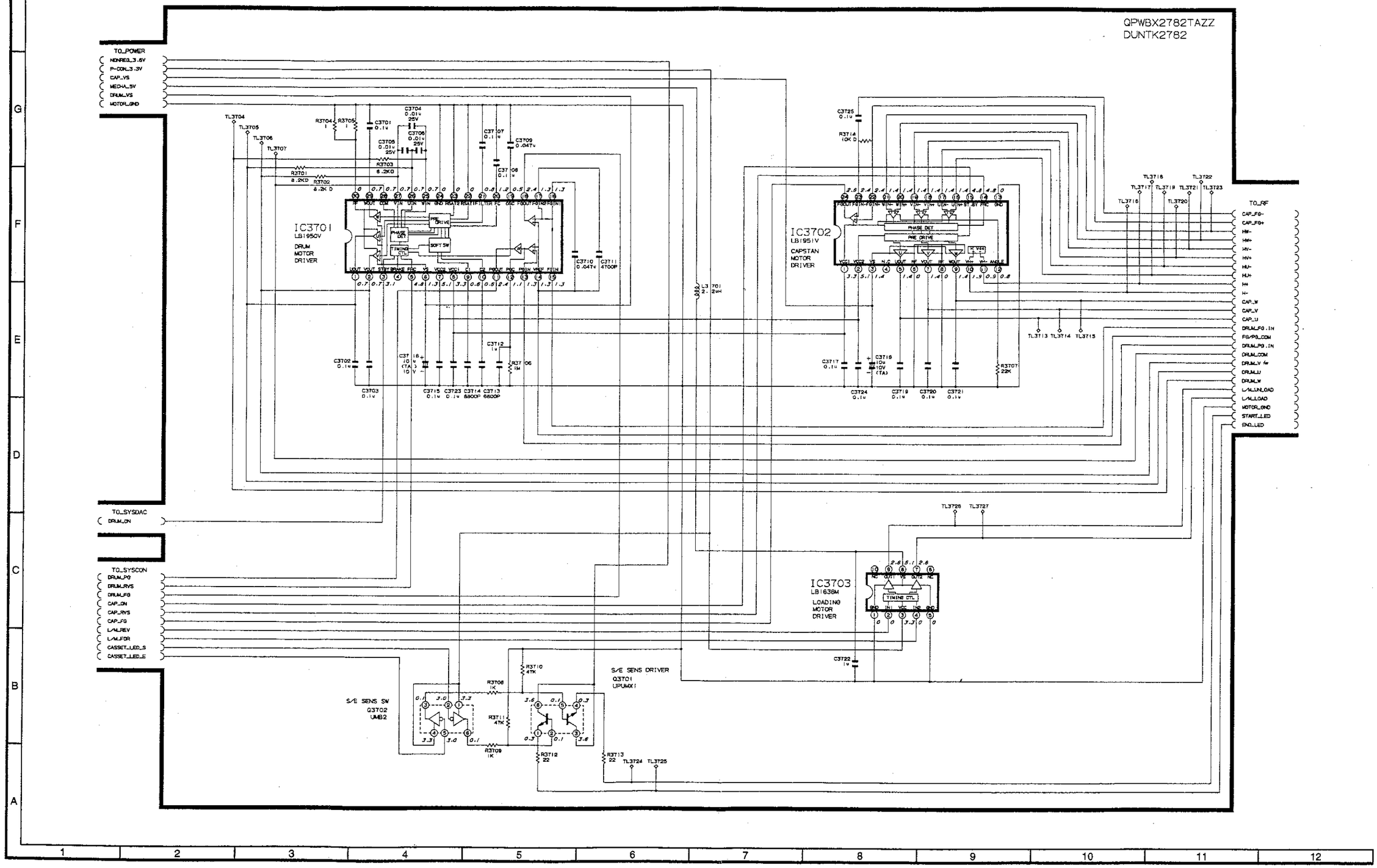


8-3. AUDIO CIRCUIT SCHEMATIC DIAGRAM



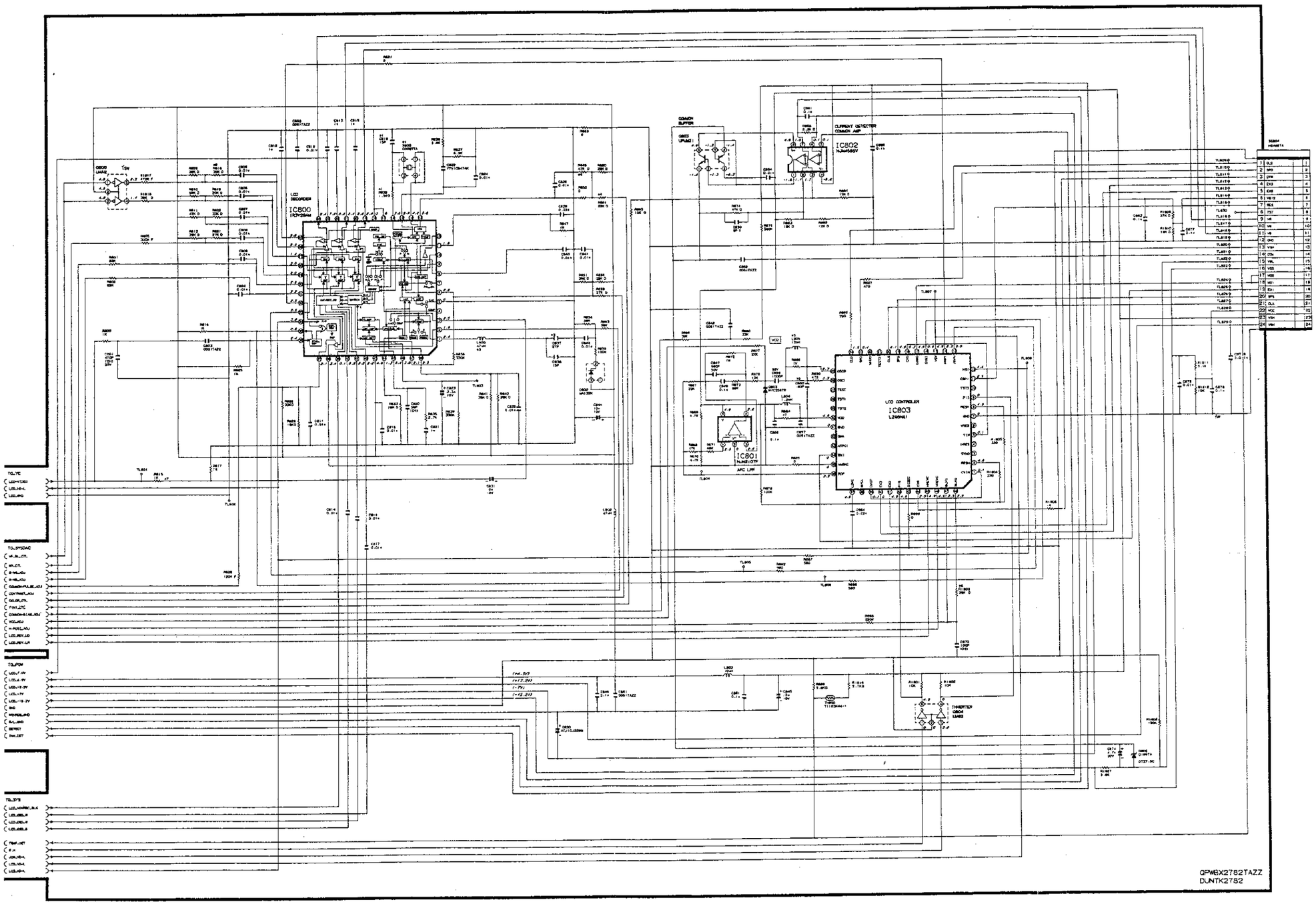
8-5 8-6

8-4. MOTOR DRIVER SCHEMATIC DIAGRAM

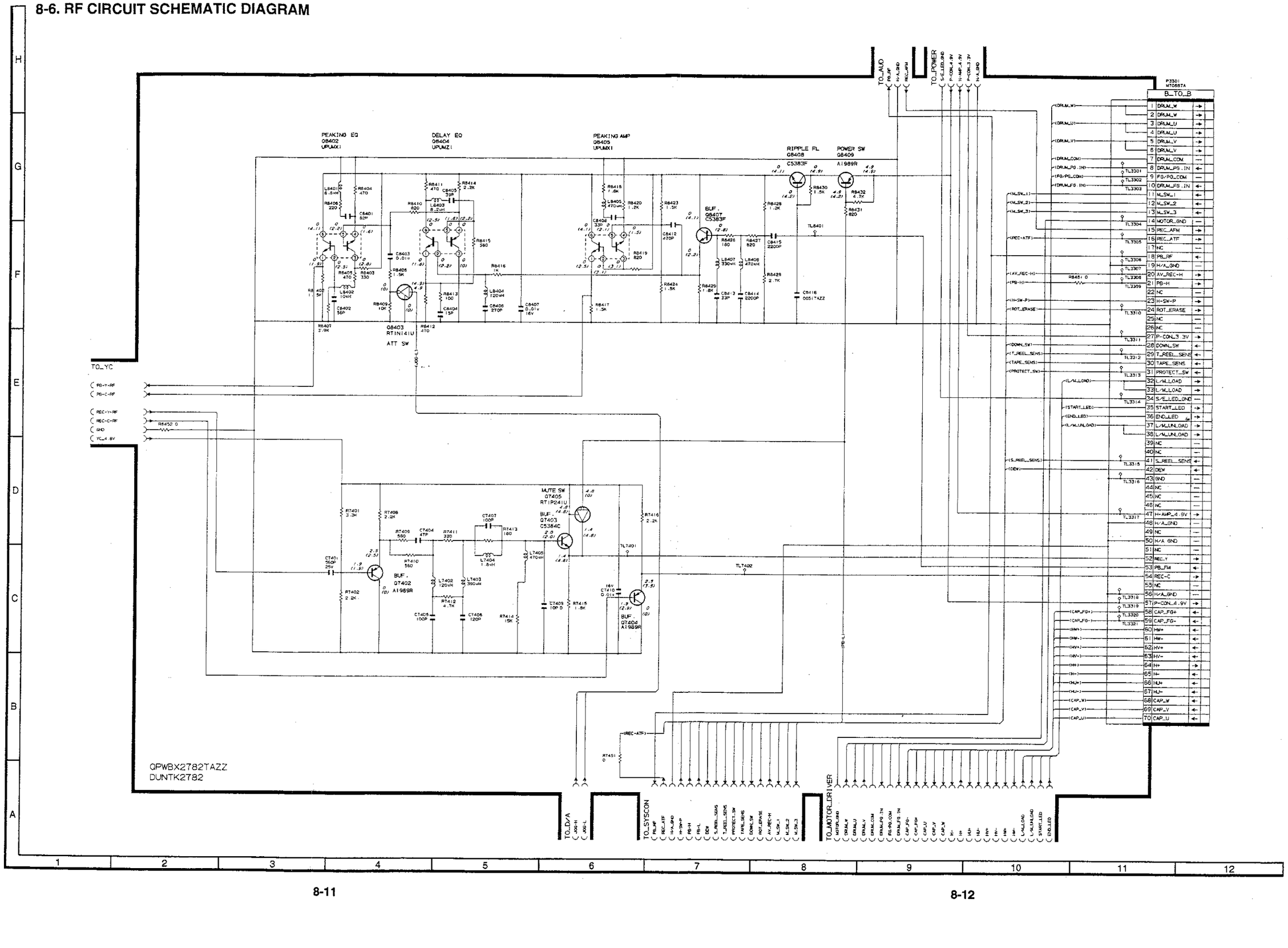


8-5. LCD DISPLAY CIRCUIT SCHEMATIC DIAGRAM

* See Page 8-21 When replacing the IC800

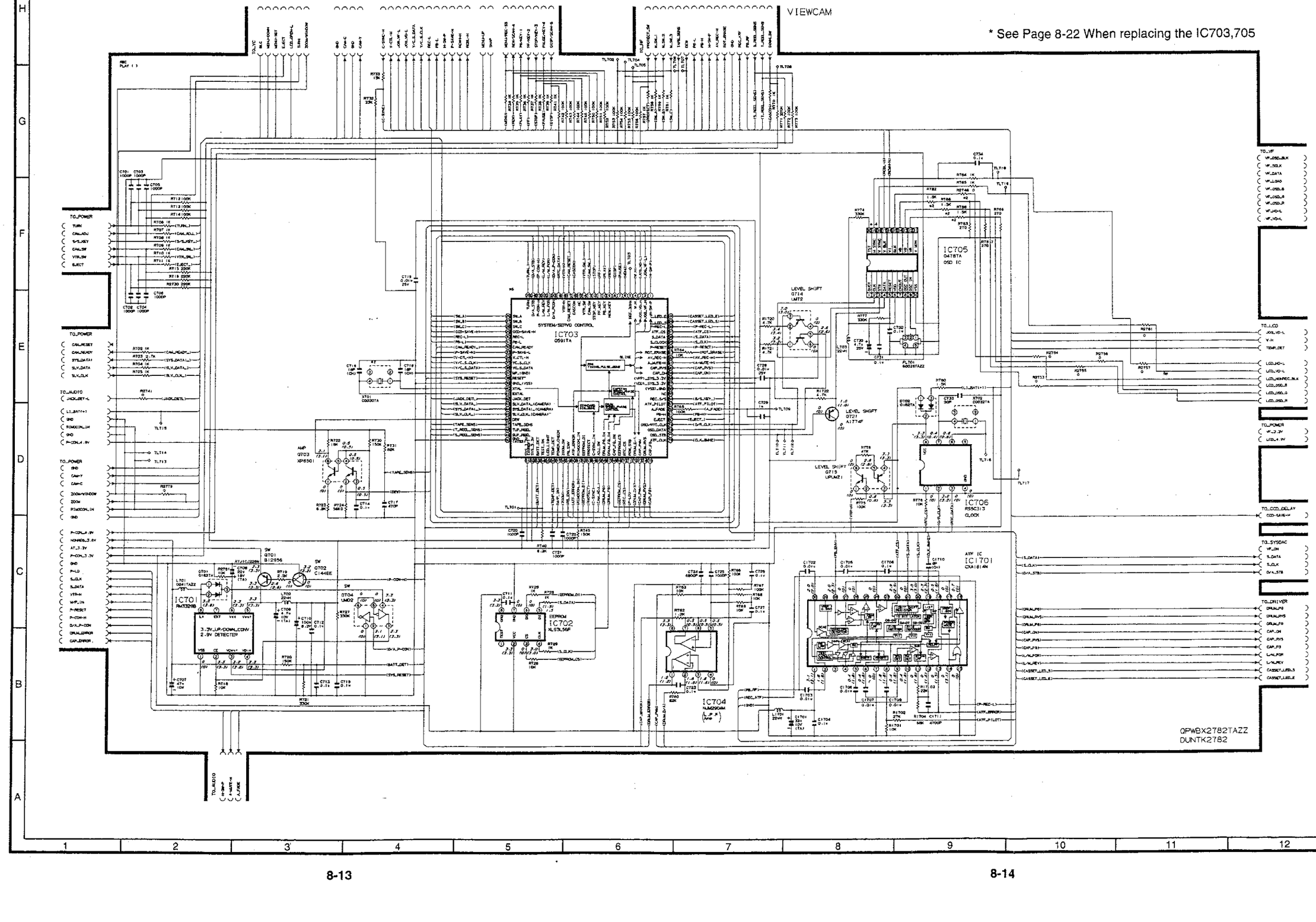


8-6. RF CIRCUIT SCHEMATIC DIAGRAM

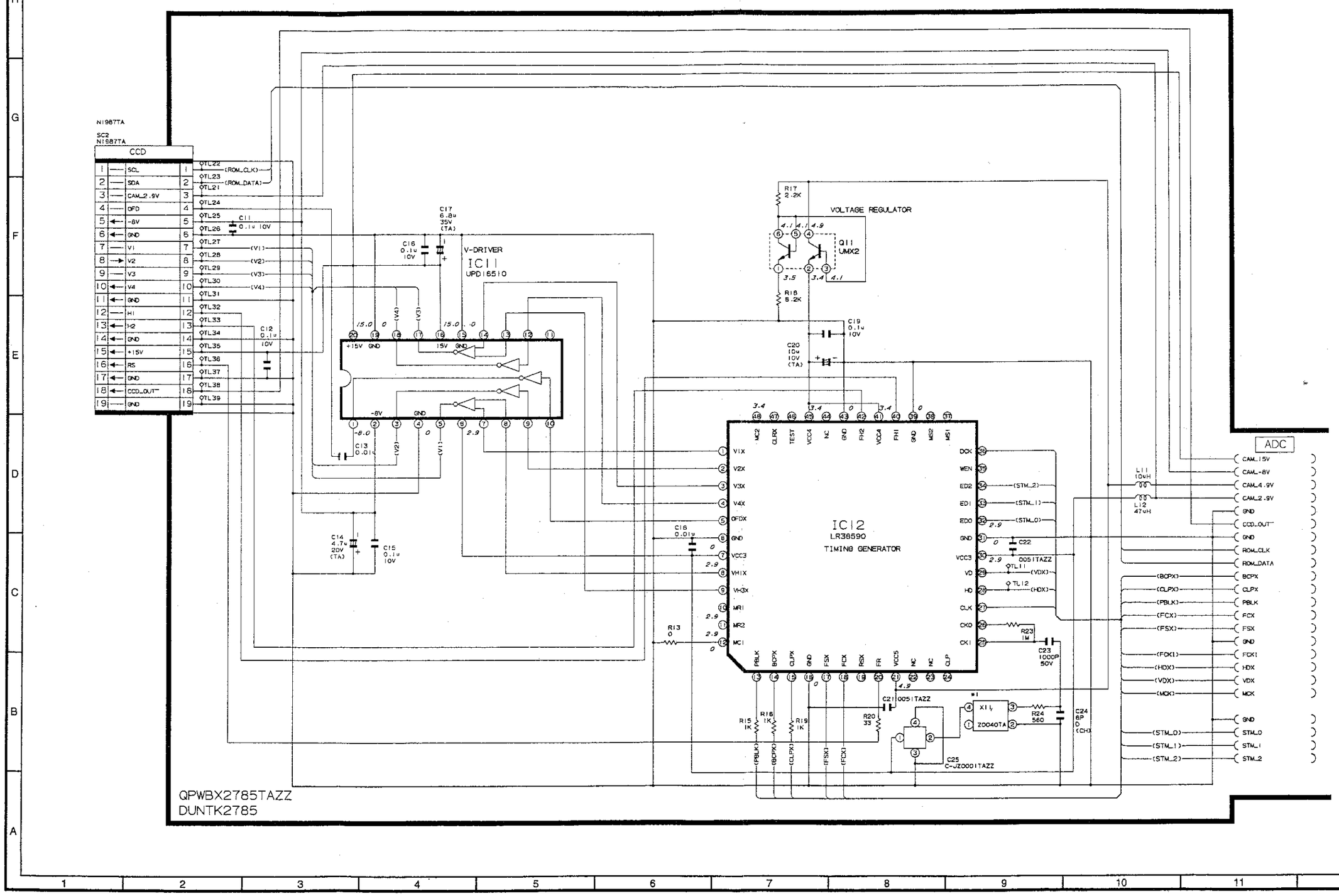


8-7. SYSTEM CONTROL CIRCUIT SCHEMATIC DIAGRAM

* See Page 8-22 When replacing the IC703,705

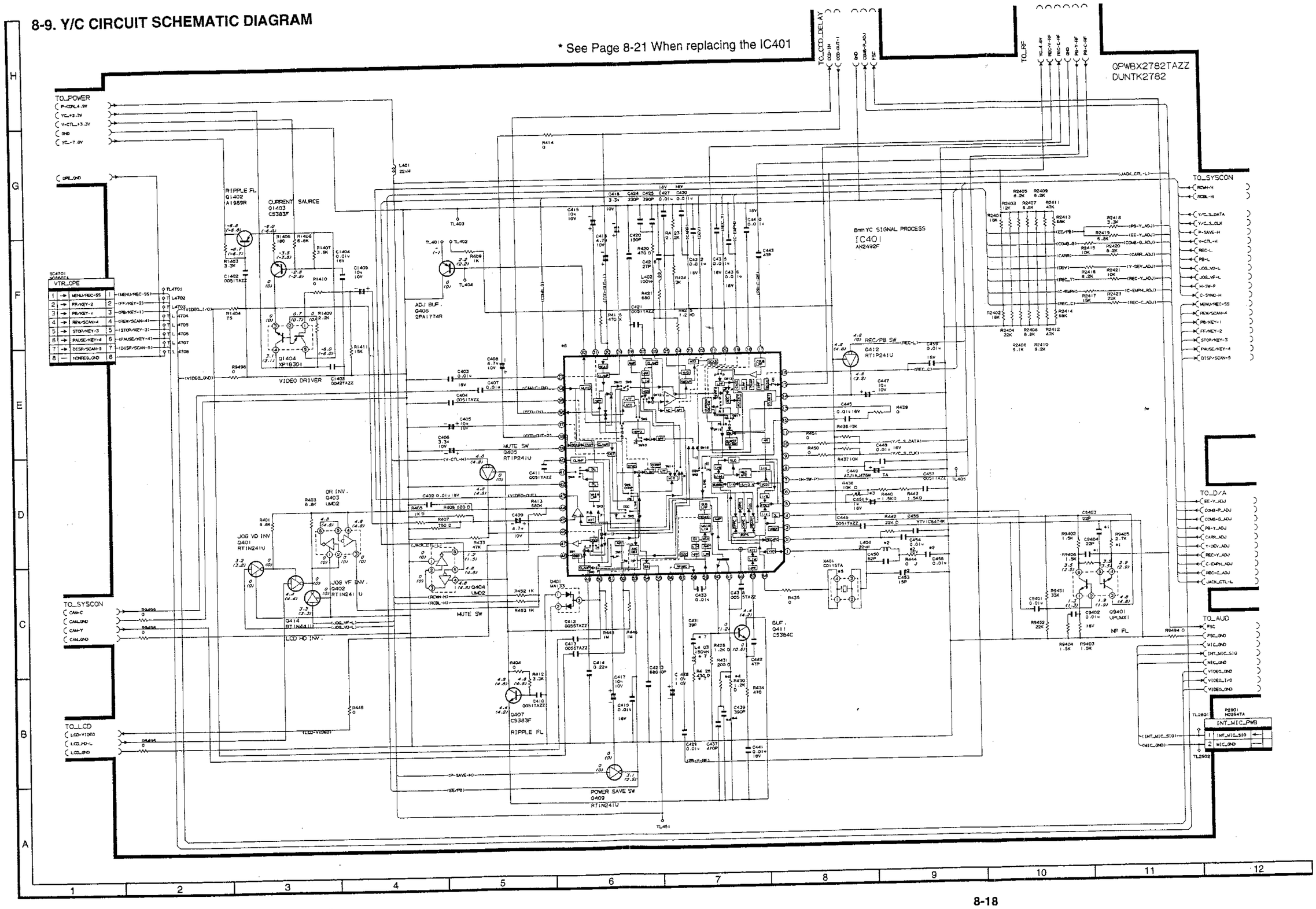


8-8. TG CIRCUIT SCHEMATIC DIAGRAM

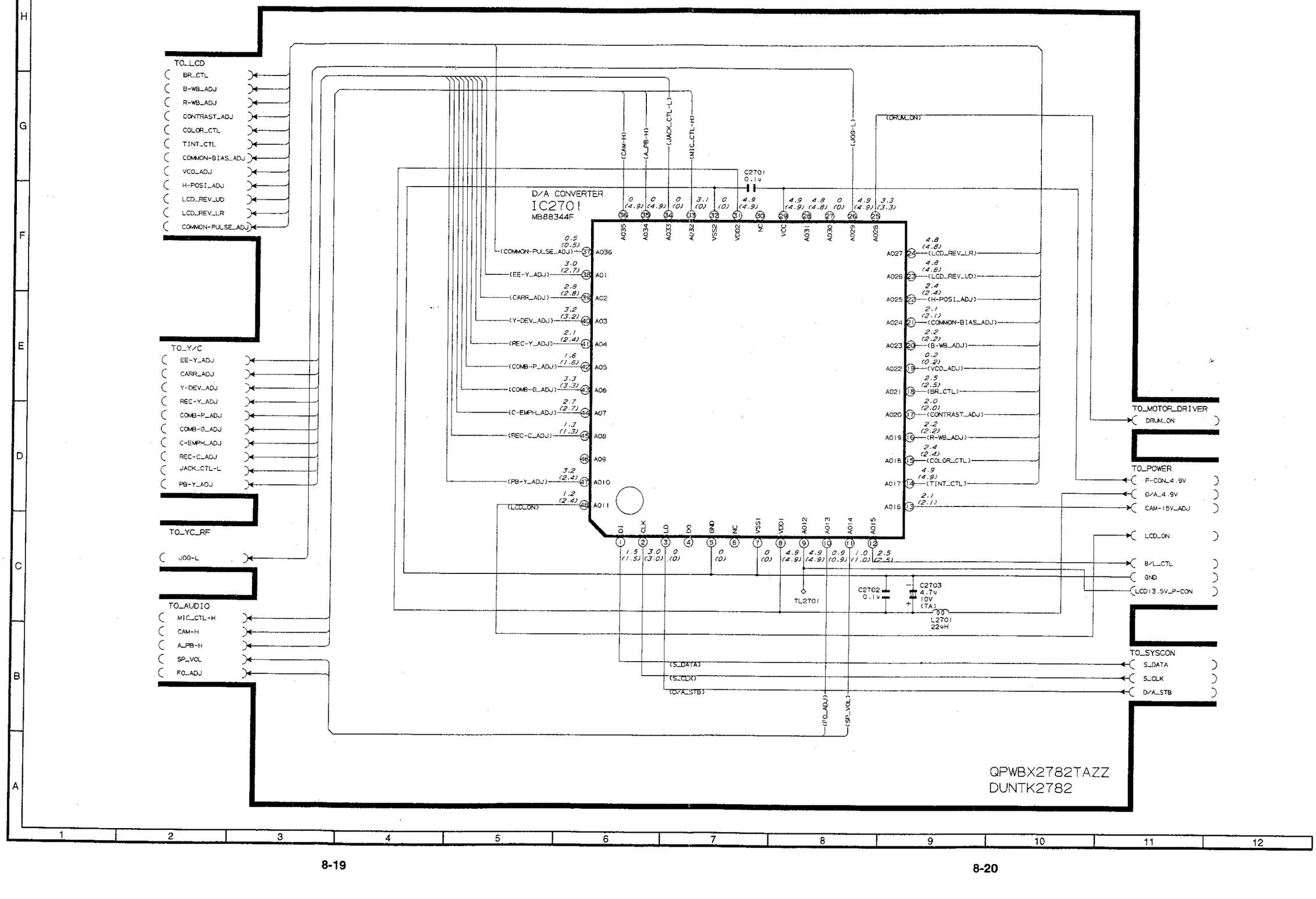


8-9. Y/C CIRCUIT SCHEMATIC DIAGRAM

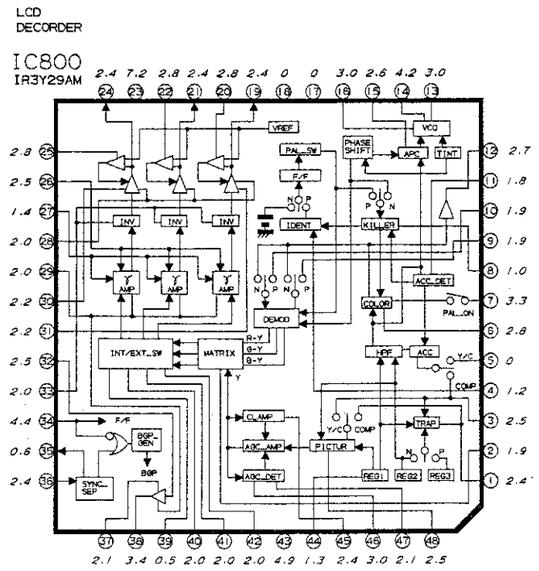
* See Page 8-21 When replacing the IC401

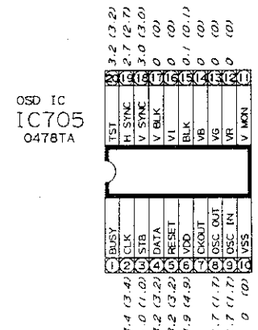


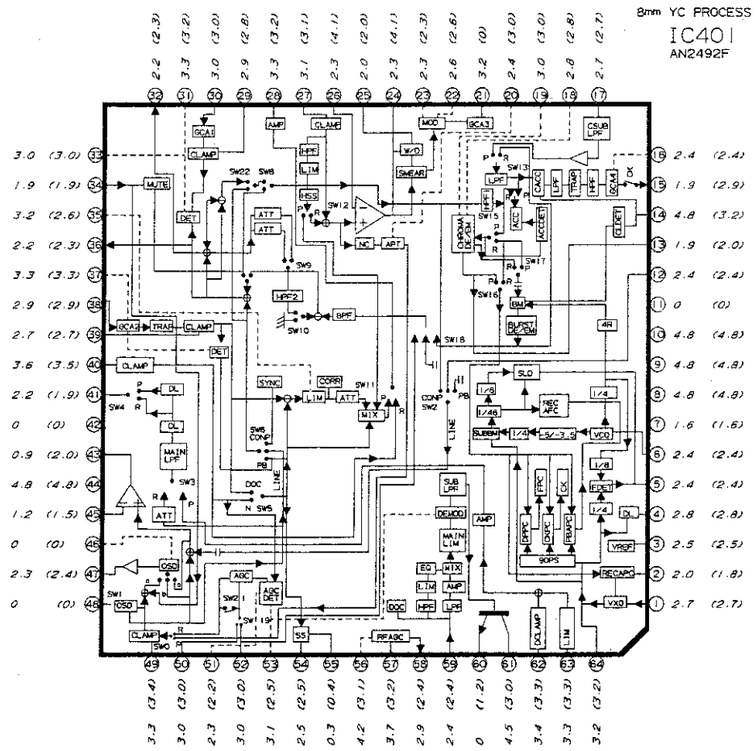
8-10. D/A CIRCUIT SCHEMATIC DIAGRAM

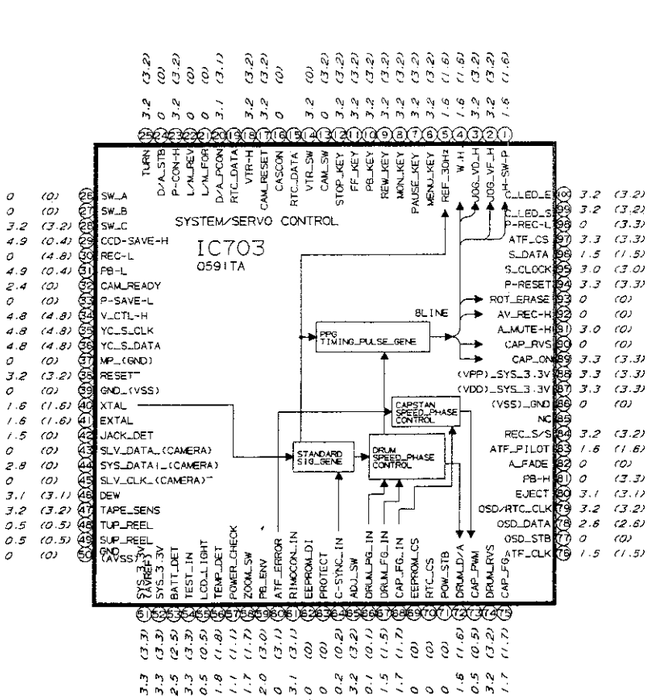


8-11. SYSTEM/SERVO CONTROL AND Y/C INTERGRATED CIRCUIT SCHEMATIC DIAGRAM

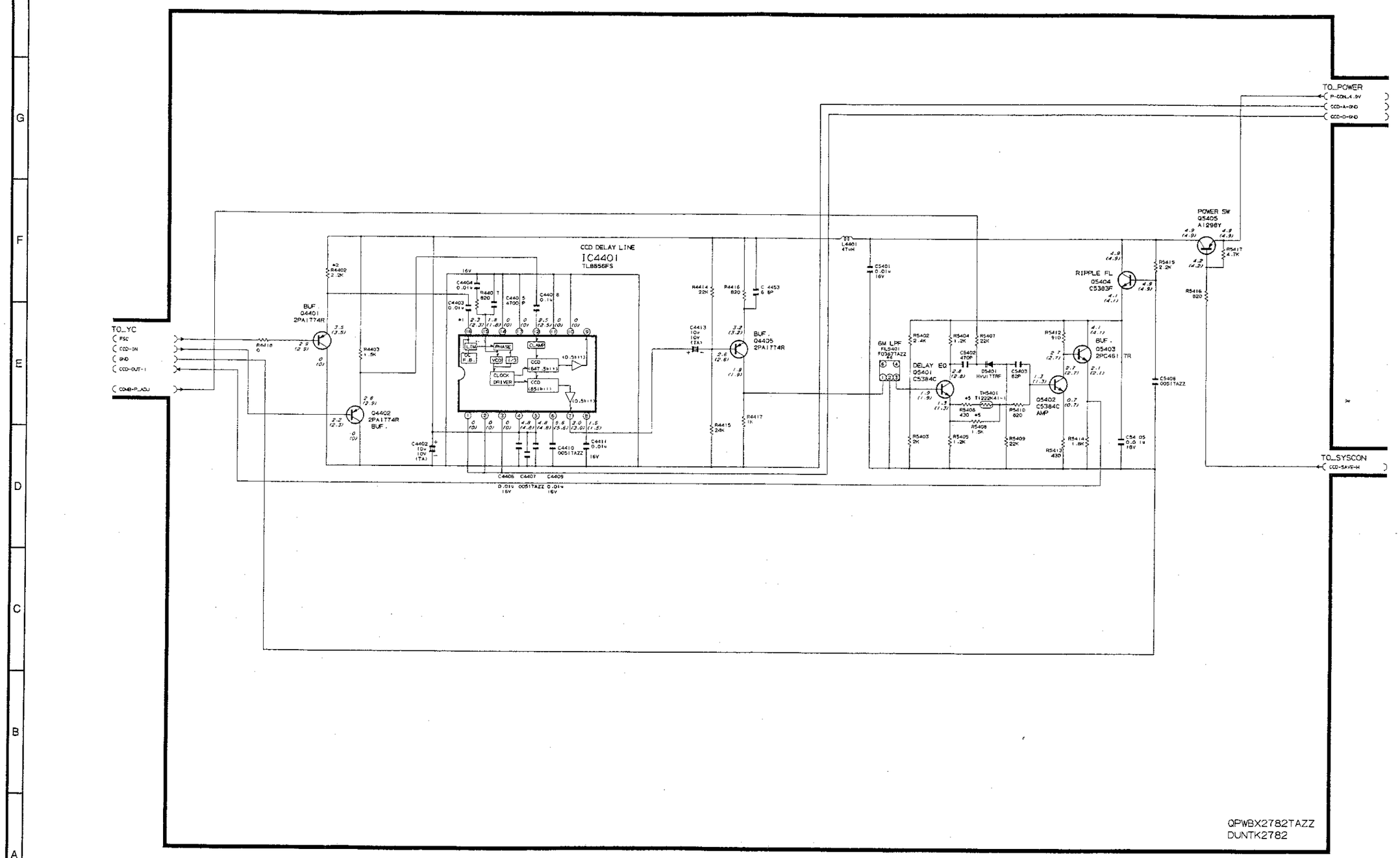




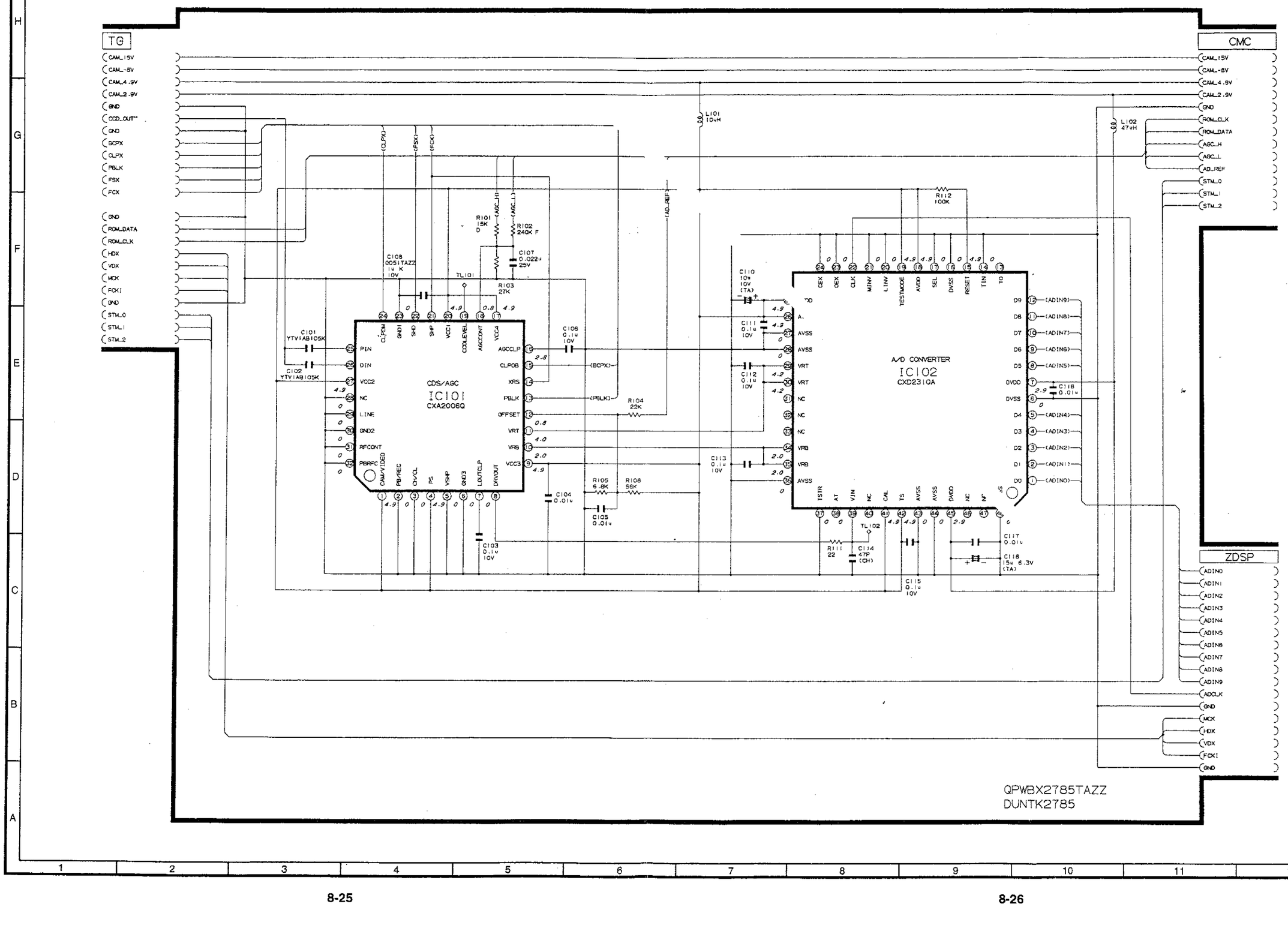




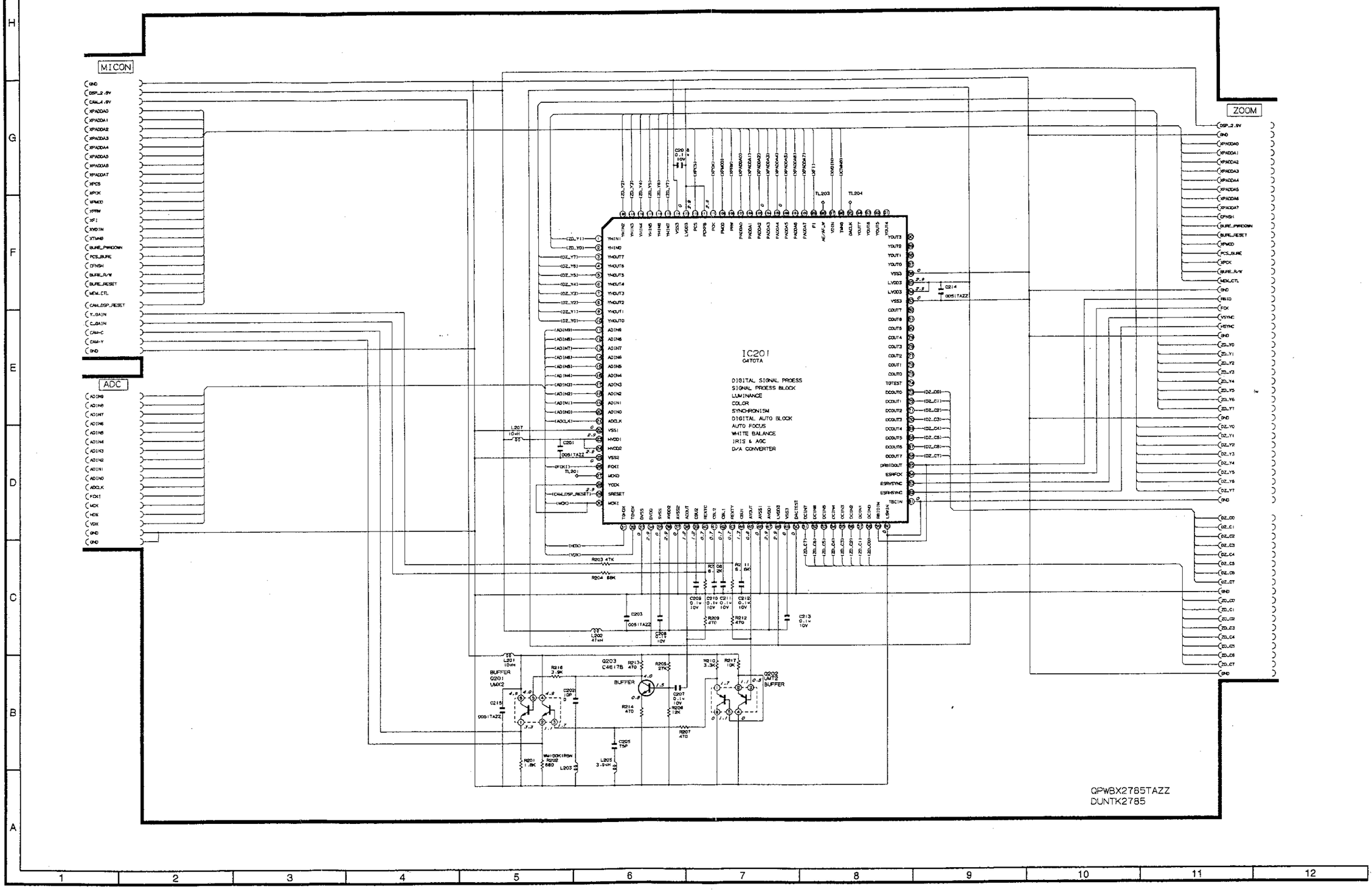
8-12. CCD DELAY CIRCUIT SCHEMATIC DIAGRAM



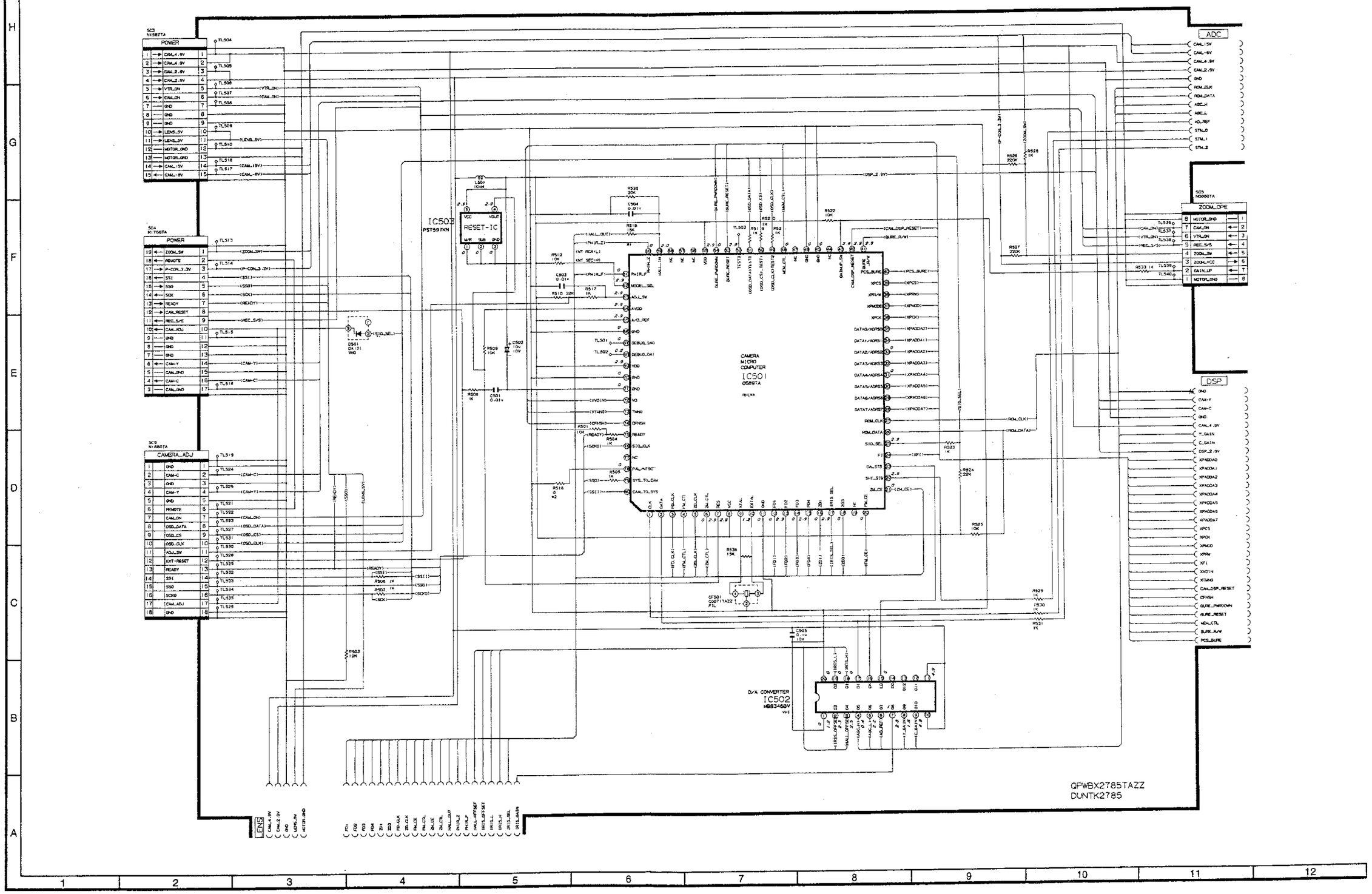
8-13. ADC CIRCUIT SCHEMATIC DIAGRAM



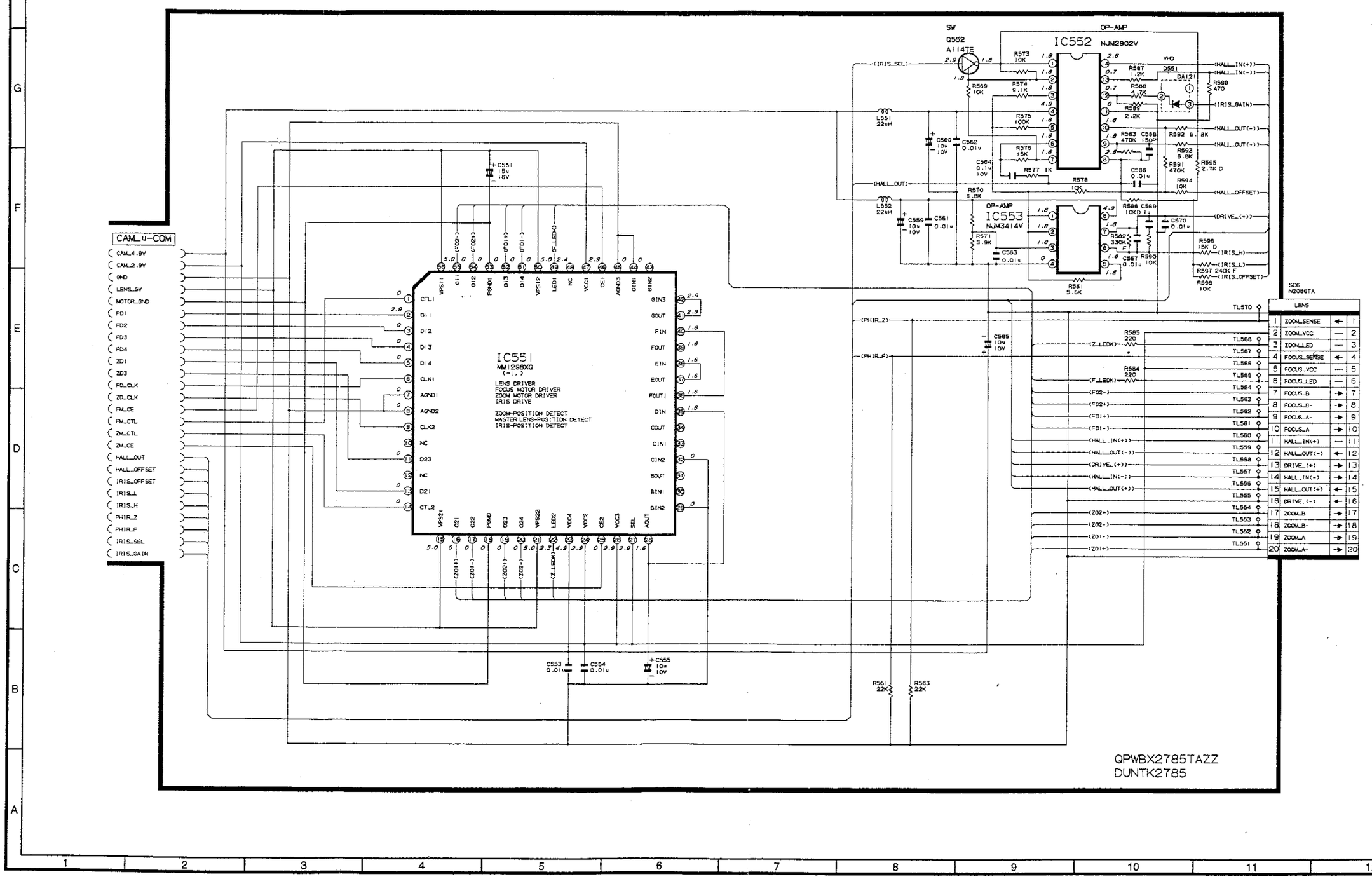
8-14. DSP CIRCUIT SCHEMATIC DIAGRAM



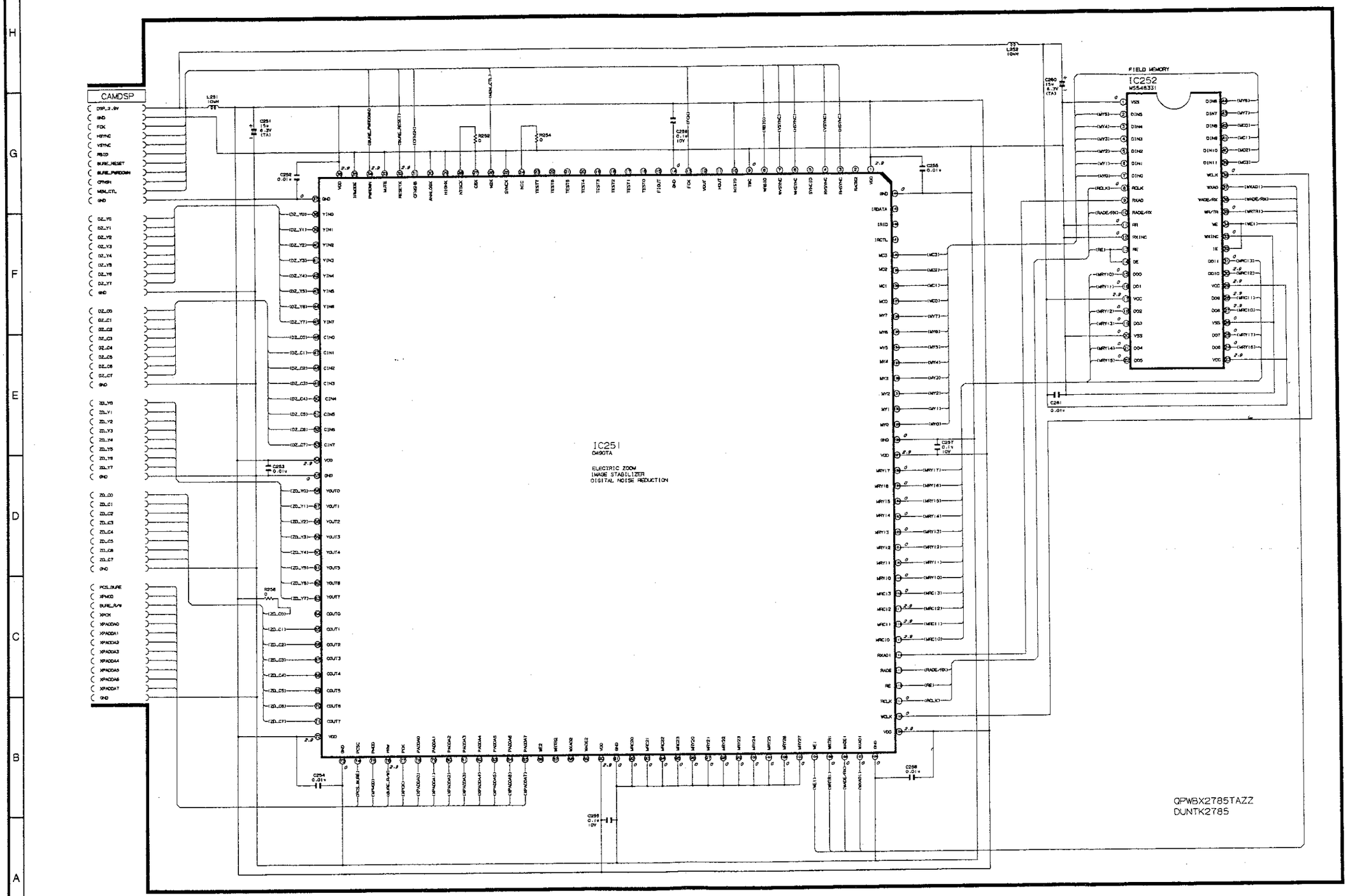
8-15. CAM µ-COM CIRCUIT SCHEMATIC DIAGRAM



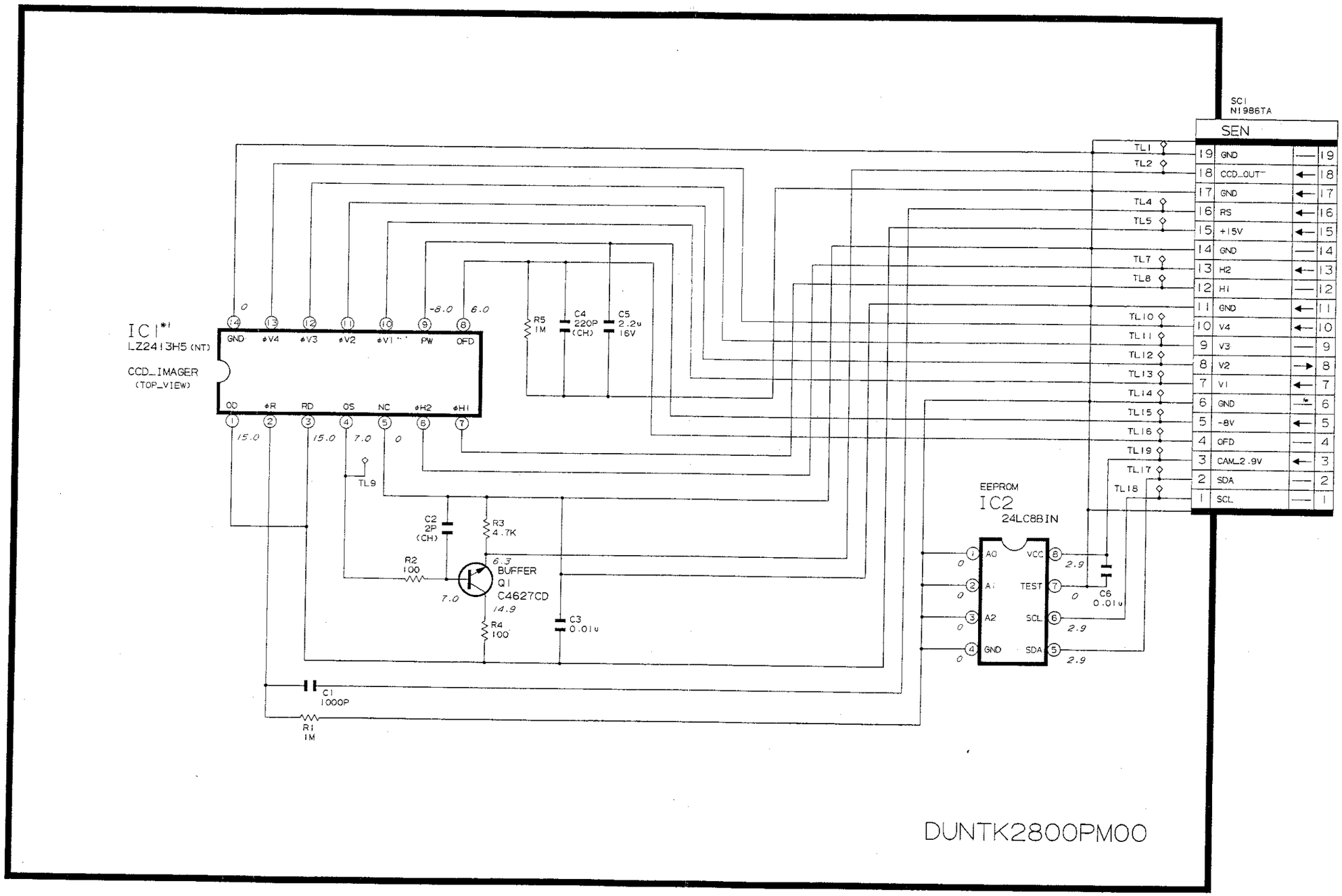
8-16. LENS DRIVE CIRCUIT SCHEMATIC DIAGRAM



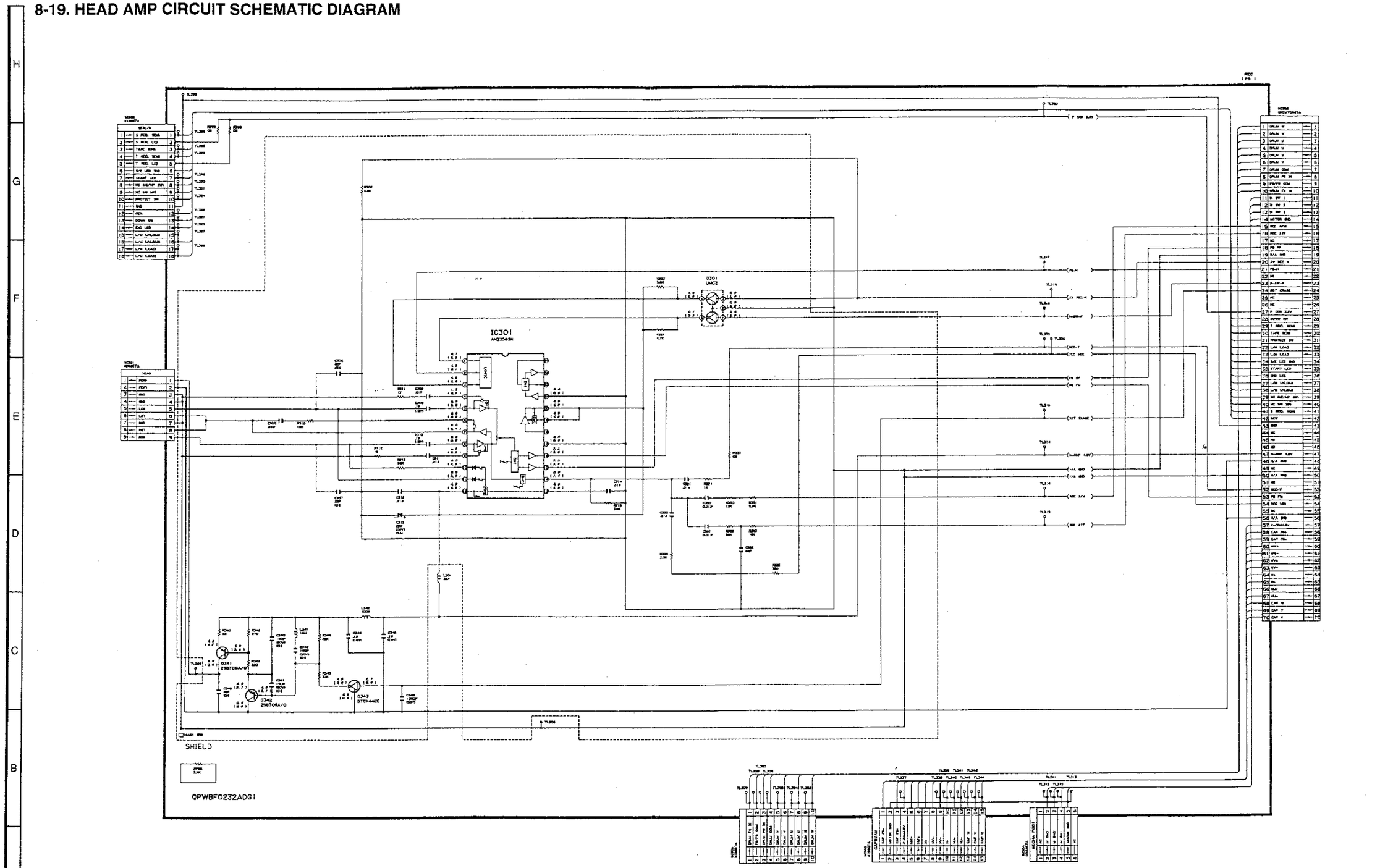
8-17. ZOOM CIRCUIT SCHEMATIC DIAGRAM



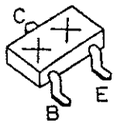
8-18. CCD CIRCUIT SCHEMATIC DIAGRAM



8-19. HEAD AMP CIRCUIT SCHEMATIC DIAGRAM



9. SEMICONDUCTOR LEAD IDENTIFICATION



2SA1298Y
2SA1774F
2SA1832Y
2SB12956
2SC4555
2SC4738
2SC3931C
2SD2216
DTA144EE
2SC4627C
2SC4617B
2PA1174R
2PC4617R
2SC5383F
2SC5384C
25A1989R

DTC144EE
DTC323TK
RN2104
2SD1328-S
2SA1037KQ
DTA114EE
UN9213
UN9113
DTC123EE
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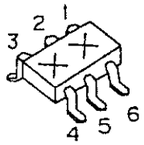
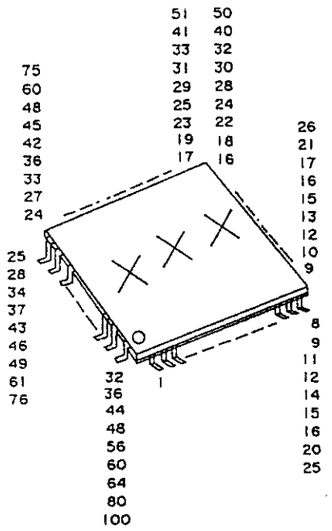
RT1P441U



UMD2
UMT2
UMX2
UMZ1
XP4111
XP4113
XP4213

XP4601
XP6501
UMH2
UPUMZ1
UPUMT1
UPUMX1



MB3785V
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IX0437TA
IR3Y29AM

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IX0452TA
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LR38519

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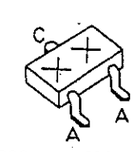
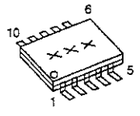
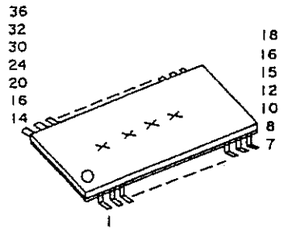


DAN222 MA132WK



LB1683M



IX0238TA
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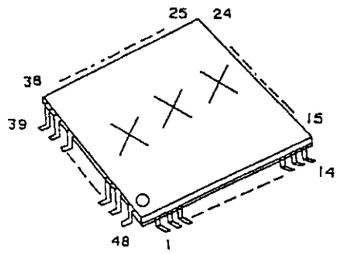
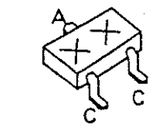
M62352GP
MC14053V
MB3775FV
TL8856FS

AN3358SH
MB8346BV
UPD16510
LB1850V
NJU4066V
LB1843V

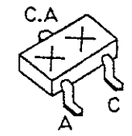
LB1882V
CXA1814N
NJM2902V



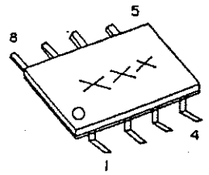
M52369FP



MA132WA
DX0182TA



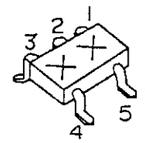
MA133
MA147



BA7655AF
ST93C46T
NJM4565V

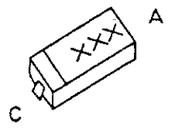
NJM3414V
NJM4558M
NJM2904M

RM3329B
NJM2233V
NJM4565V

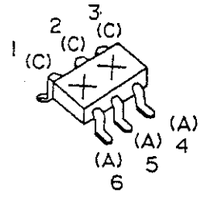


UMG2
S8435CF
XP1501
NJM2107F
SC14S66F
SC7S08F
UMC5
XP1B301
XP1C301
XP1401

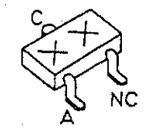
2SB1121T
2SB1132Q
2SB1302S
2SB1123T
SB20W03P
2SK2316



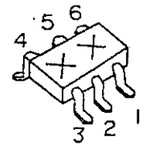
SFPB54
HVU17TRF
EX0870CE
HVU359TR



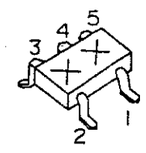
FC903
IMN10



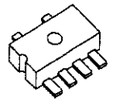
DA121
MA132K
EX0152TA



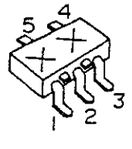
RN4604
XN4402
XN4504
XN6401



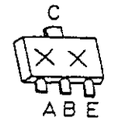
FMY1



FX803



FP301



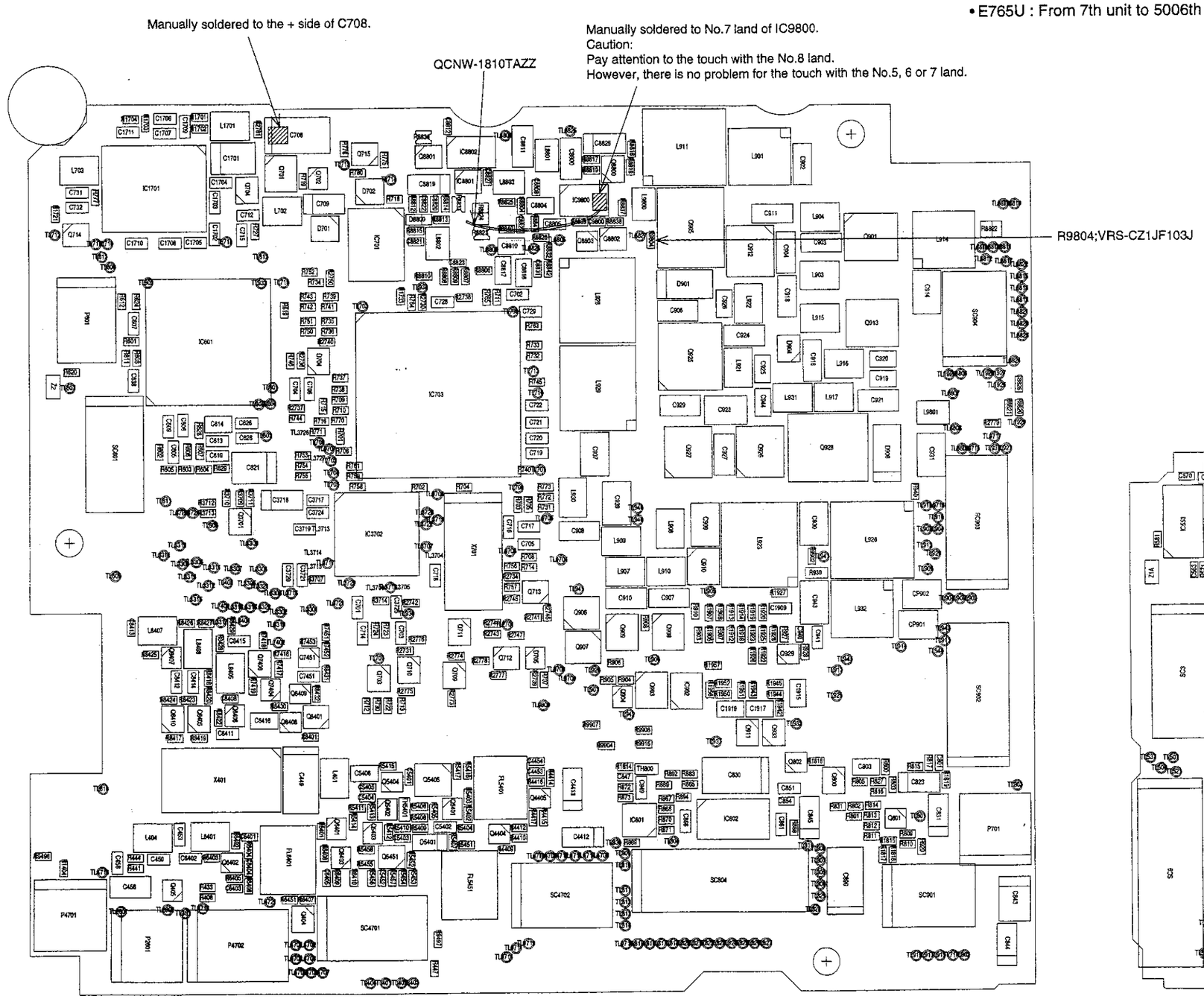
MPL1

10. PRINTED WIRING BOARD ASSEMBLIES

10-1. P.W.B. Component Side SIDE A

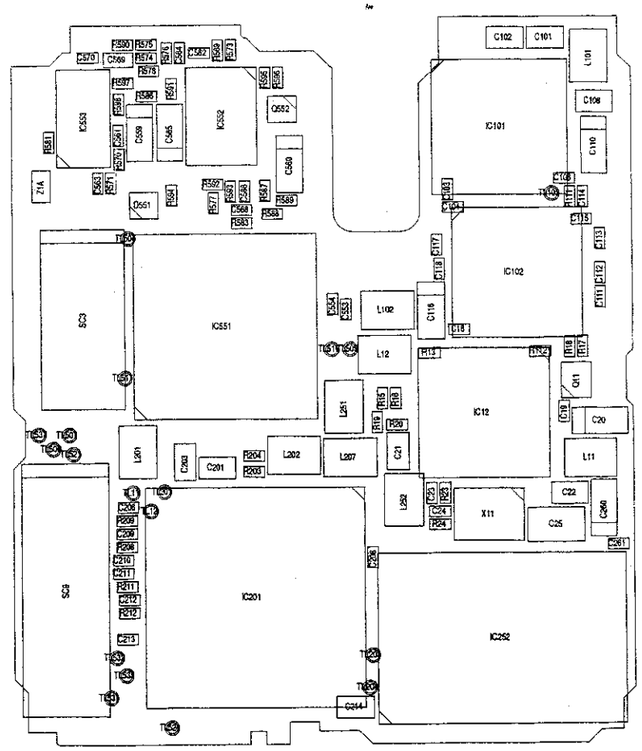
- This especially corresponds to ⚠ only.
  The number of units is as follows.
- E760U : From 21st unit to 5020th unit (5,000 units)
- E765U : From 7th unit to 5006th unit (5,000 units)

MAIN P.W.B.


Manually soldered to the + side of C708.
QCNW-1810TAZZ
Manually soldered to No.7 land of IC9800.
Caution:
Pay attention to the touch with the No.8 land.
However, there is no problem for the touch with the No.5, 6 or 7 land.
R9804;VRS-CZ1JF103J

10-1

CAMERA P.W.B.

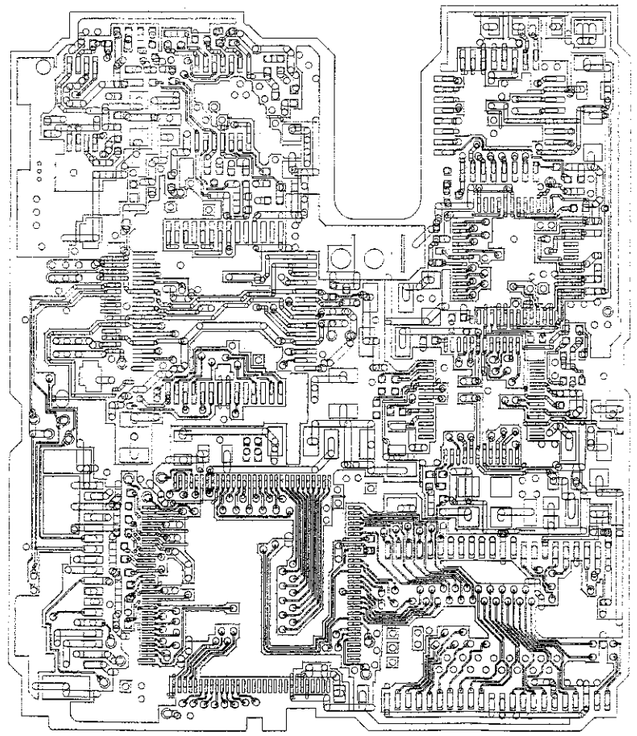


10-2

VL-E760U VL-E760U
VL-E765U VL-E765U

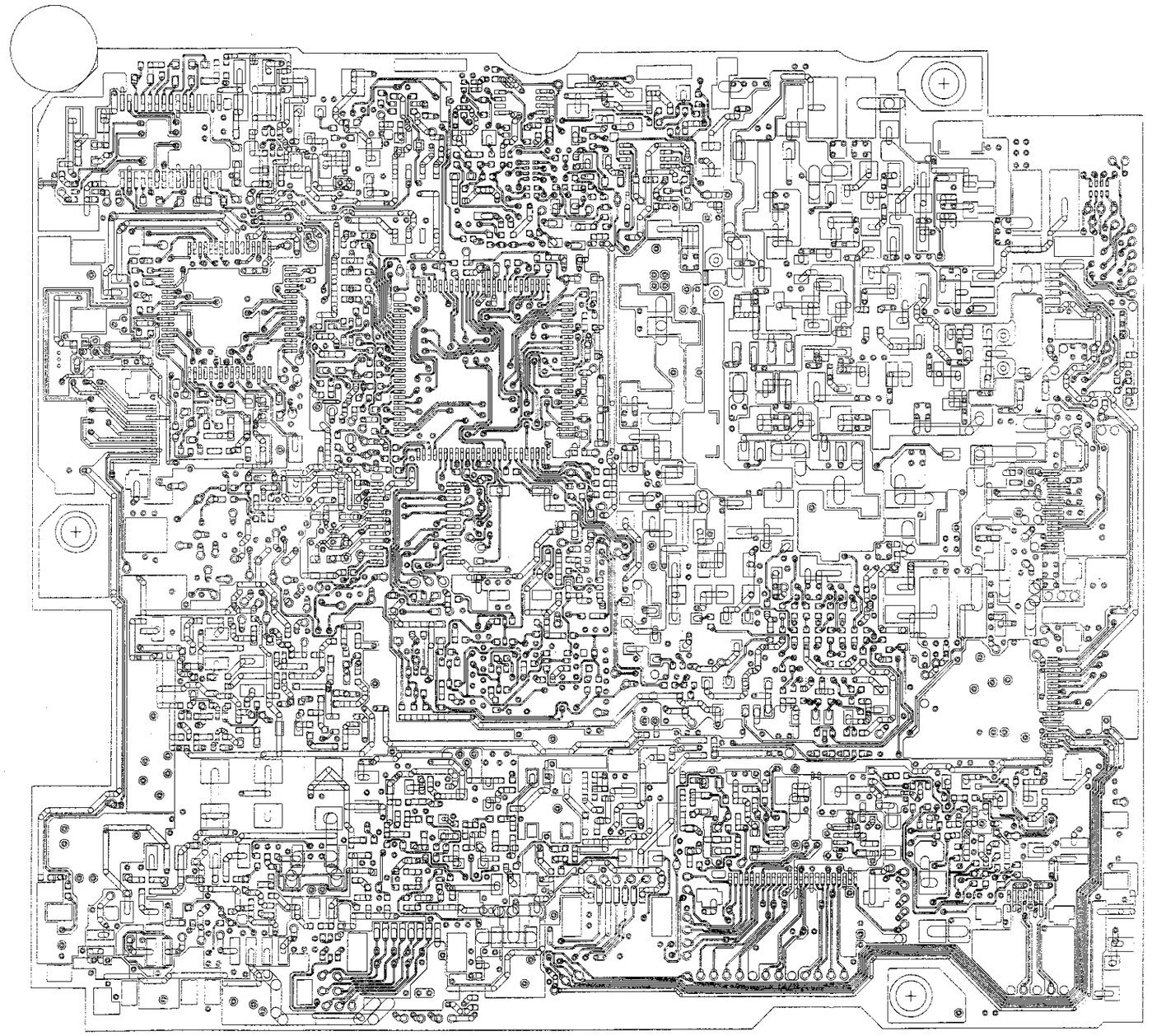
10-2. P.W.B. Wiring Side SIDE A

CAMERA P.W.B.



10-3

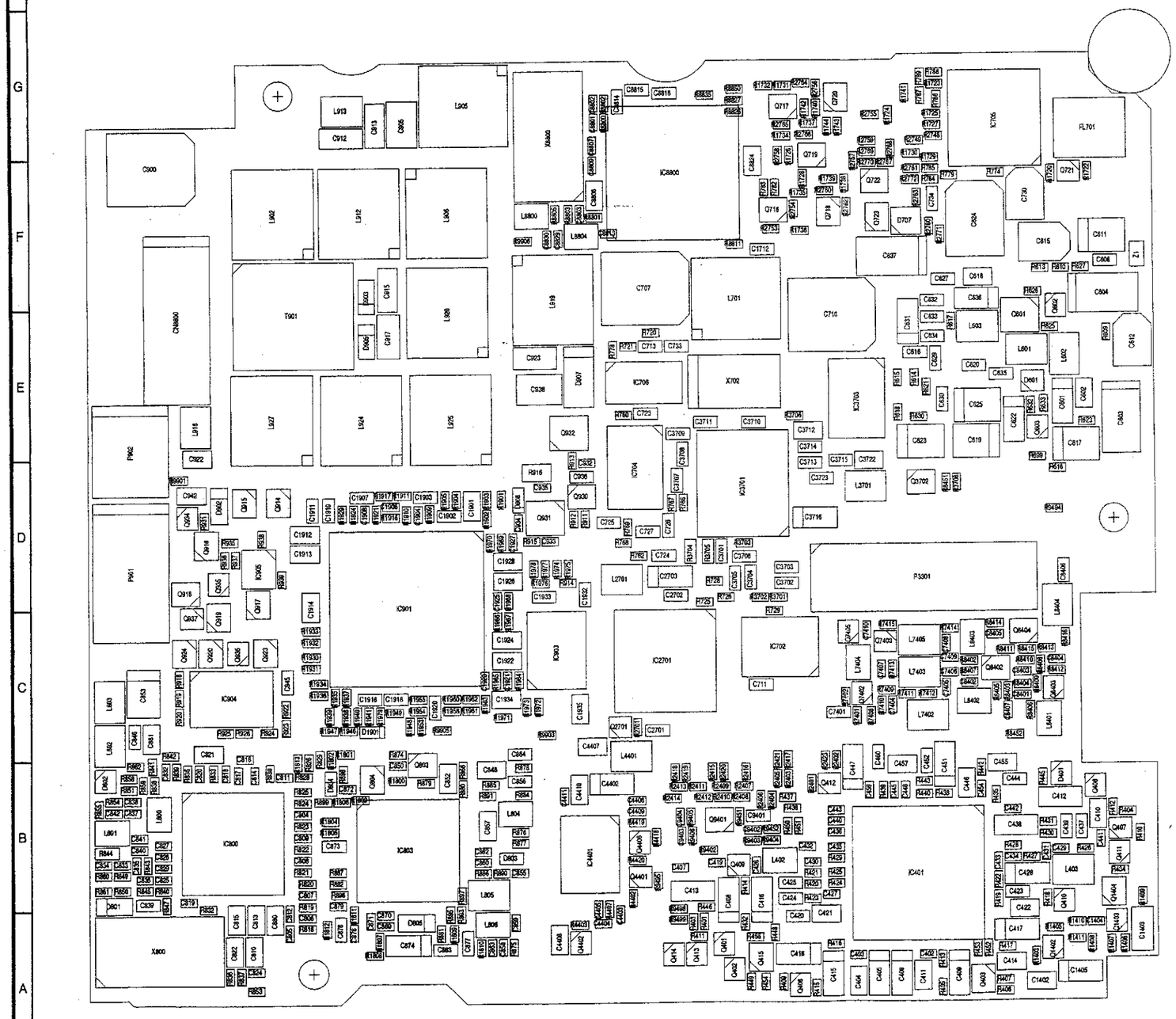
MAIN P.W.B.



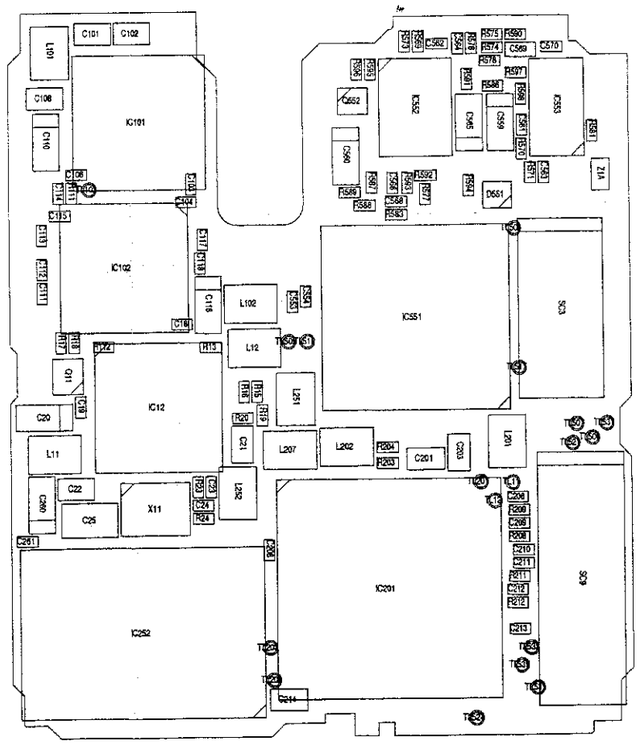
10-4

10-3. P.W.B. Component Side SIDE B

MAIN P.W.B.



CAMERA P.W.B.



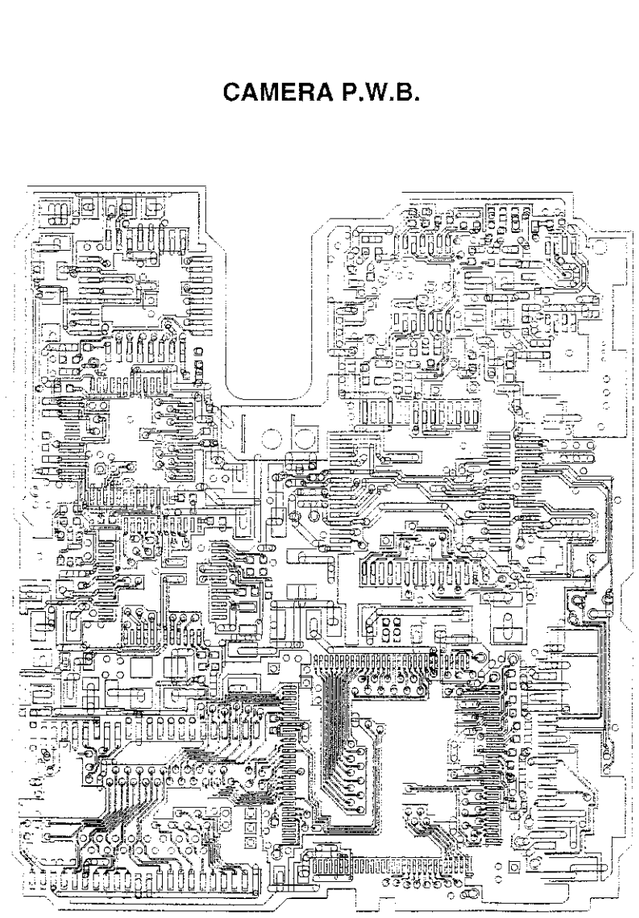
10-5

10-6

VL-E760U VL-E765U

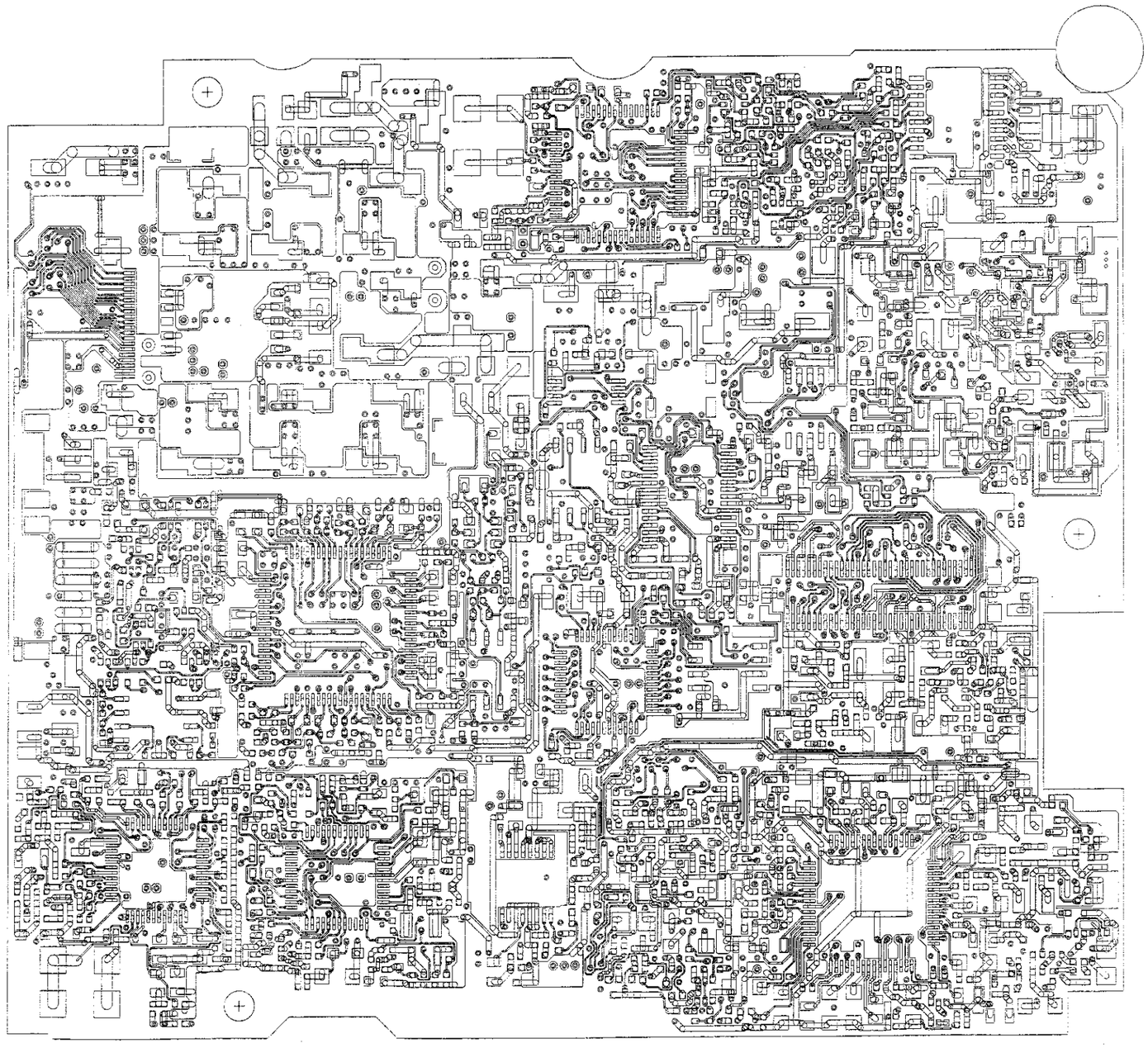
10-4.P.W.B. Wiring Side SIDE B

CAMERA P.W.B.



10-7

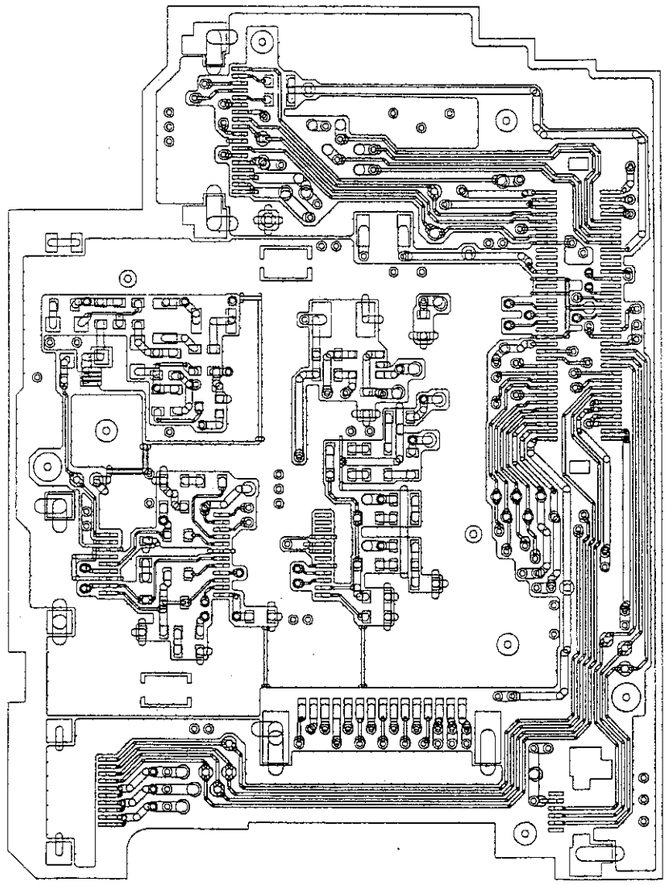
MAIN P.W.B.



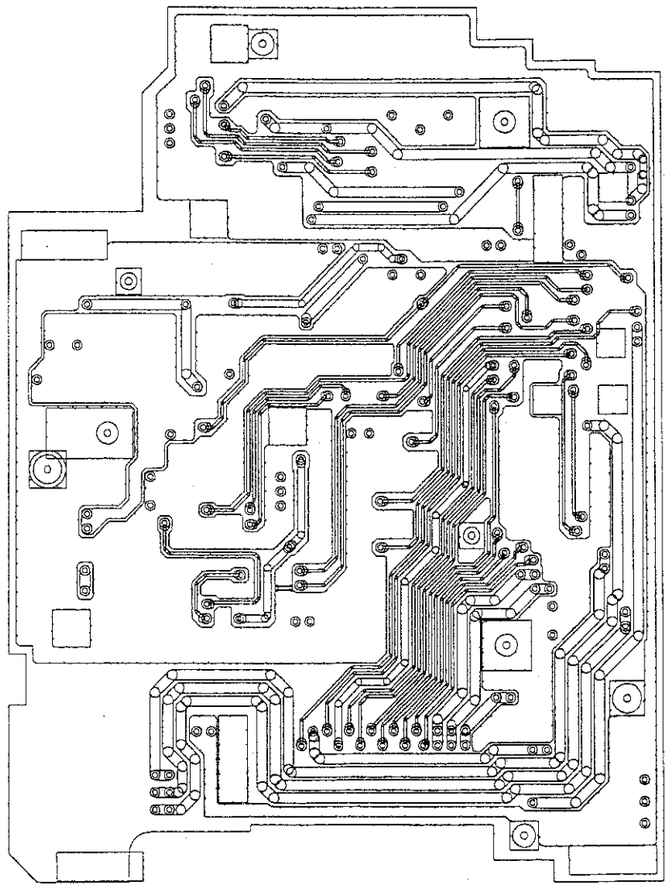
10-8

10-5. HEAD AMP P.W.B.

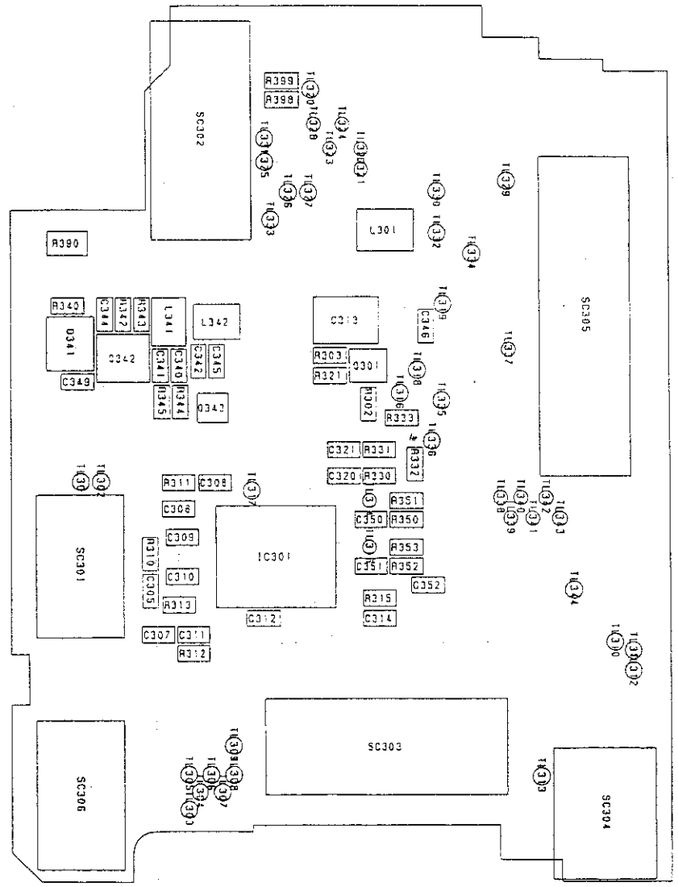
Wiring Side SIDE A



Wiring Side SIDE B



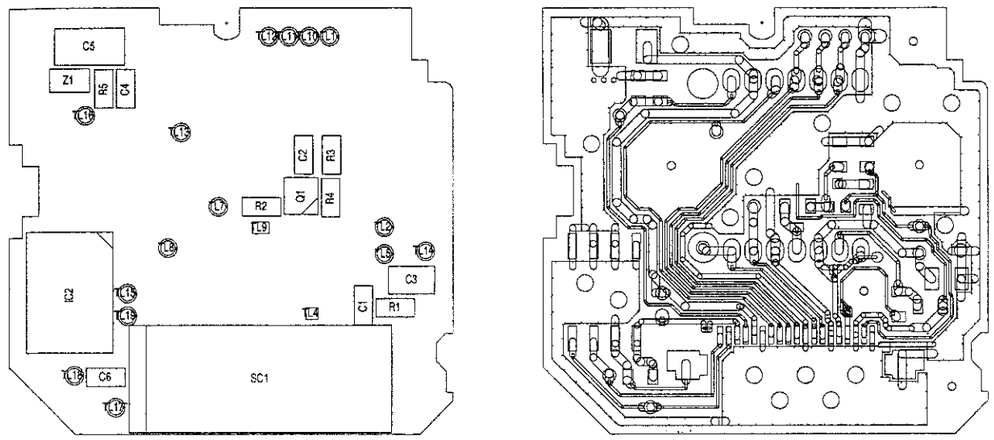
Component Side SIDE B



10-6. CCD P.W.B.

Component Side **Wiring Side**

SIDE A



SIDE B